THE AMERICAN GAS-LIGHT JOURNAL AND CHEMICAL REPERTORY

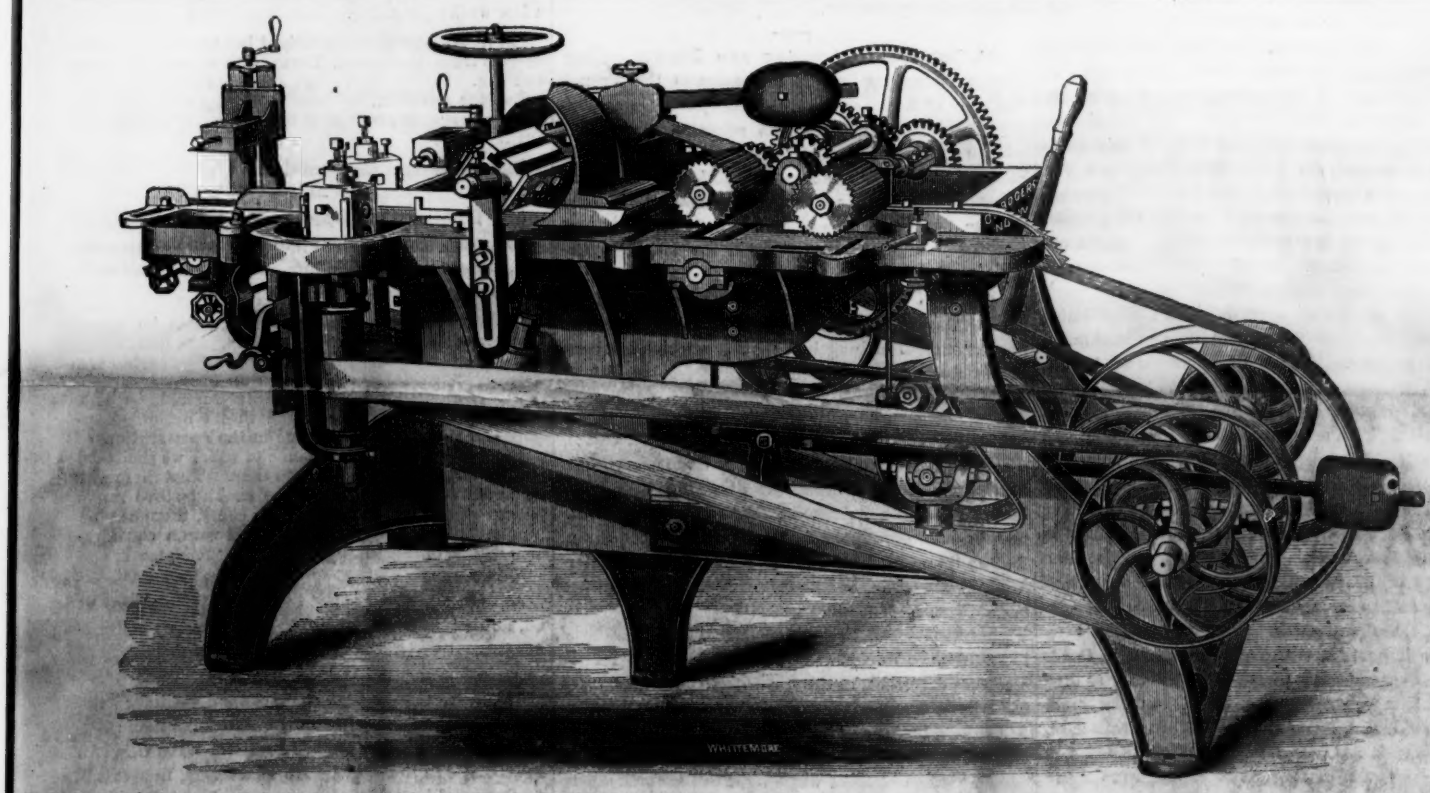
Publishing Office, No. 42 Pine Street.

Devoted to the Interests of Illumination, Heating, Ventilation and Sanitary Improvement, Domestic Economy, and General Science.

VOLUME XVII.—No. 12.
WHOLE No. 311.

NEW YORK, MONDAY, DECEMBER 16, 1872.

$3 PER ANNUM
IN ADVANCE.



Patent Four Side Moulding Machine.

This machine is intended especially for the molding makers of this country, as it is fully adapted to any size or style of molding, from the smallest to eight inches, working either with the greatest rapidity and accuracy.

The illustration herewith, represents the largest outside head molders, and will work any molding from eight inches down. It is also suitable for planing and matching flooring and ceiling, and working staves. The four heads are all gun-metal, slotted on four sides, the top and bottom heads eight inches wide, and the side heads open eight inches apart. The arbors are all of the best English steel, and run in self-oiling boxes, and the top arbor has an outside support to steady it. The side spindles are both adjustable vertically, or on any angle, and may be moved out or in without disturbing the angle. The under cylinder is also adjustable vertically. The bed is moved by a single screw and hand-wheel, and drops seven inches. The feed works are very strong, being weighted and driven by patent expansion gearing, and has four changes of feed, ranging from 15 to 50 feet per minute, which are obtained by a change of pinion gears, the feed being driven by a friction pulley attachment on the feed belt. It has also a roll in the bed which is driven by the expansion gears, and adds greatly to the power of the feed. The machine is furnished with pressure-bars, springs and guides, and everything necessary for quick adjustment. They are built to work three or four sides, as desired. Each machine is furnished with a slotted head on each arbor, and one set of cutters in each. Extras are furnished when wanted—matcher heads and cutters, any styles of molding cutting cutters, or any of the heads and cutters described for this machine in the printed catalogue. The tight and loose pulleys on countershaft are ten inch diameter, six inch face, and should make 1,000 revolutions per minute. Weight of machine, not boxed, 1,900 lbs. Power required to drive molder, five horse-power. All the internal belts for the machine are furnished. The main driving belt should be 5½ inch.

Further information can be had on application to G. B. Rogers & Co., 109 Liberty street, New York.

Mr. Snygross, a banker of Constantinople, has secured a contract for lighting the streets of Athens with gas.

Testing Steam Boilers---An Excellent Suggestion.

The boiler in which is generated and the engine in which is utilized the great motor, steam, are undoubtedly the most important inventions yet discovered, and it is not too much to say, perhaps, that in perfecting them more careful study and investigation have been brought to bear than upon any mechanical subject. Of late, steam boilers have been the especial object of a large class of inventors, some of whom differ widely from others in their views and applications of the principles involved. We have even seen one inventor claim as an especial advantage in his boiler the doing of what another claimed as the special merit of his to prevent. Of the business men who have occasion to purchase and use boilers, comparatively few have the time, or inclination, or technical education necessary for correct judgment upon the subject. Hence, while the conflicting views and constructions of boilers cannot all be right, they all have their patrons and advocates. It is of the first importance to determine as accurately as it is possible to do the relative merits of all the different systems. Theorize as accurately as we may, there is still a large mar-

gin of uncertainty which can only be made certainty by experiment. Which is the most convenient, the most durable, the most economical, and above all the safest boiler, is the question in which every individual is more or less directly interested. A communication published in another column, from a gentleman who has given much attention to this subject, contains suggestions which we heartily indorse.

He proposes that those directly interested in steam motive power in this city and vicinity be requested to subscribe to a fund, for which the American Institute shall also appropriate a sum of money, which fund shall be used under the direction of the Institute in making prolonged and exhaustive tests of the different systems of boilers, and that the results of the investigation be carefully and candidly published for the information of those interested. The character of the American Institute should be pledged to the impartial and candid treatment of the matter, and the benefit to be derived would a thousand-fold repay the trouble and expense. The proposition should find favor at once.—*Am. Artisan.*

Our Iron Future.

There is a striking unanimity of opinion concerning the grand future which awaits the iron industries of the United States, if our present opportunities are properly improved, It is seen that the use of iron can be indefinitely expanded, and that the new fields for its employment are being daily discovered. In 1856 the country consumed 84 pounds of iron per capita, whilst last year the consumption was 150 pounds. In the same period the consumption in England advanced from 144 to 200. In a few years we shall overtake her.

At the present rate of increase in the United States our production will be 7,000,000 tons per annum, in 25 years from now. But the development of the industry is phenomenal, its prospects are so grand, and the English production is growing so costly, that a good American authority predicts our production will reach, at the close of the present century, from 25,000,000 to 40,000,000 of tons annually. The London *Mining Journal*, indeed, a very competent authority admits that before the lapse of another generation, the United States will be the great iron and steel producing country of the world, by reason of the fact that Great Britain has nearly reached the limit of her expansion in these particulars.

Another important circumstance, which indicates that British capatalists are beginning seriously to turn their attention to this country as the world's great field for the development not only of these industries, but also that of coal, which is their basis, is the fact that a large number of English explorers are reported to be at present traversing our coal fields, and holding confidential interviews with our leading railroad magnates, declaring that they represented unlimited capital which is ready to invest itself for the development of our coal and iron products, if favorable reports can be given. These are notable evidences of the growing belief felt in Great Britain that the time is not distant when she will be compelled to surrender her position as the head of the iron interest of the world.—*Scientific Press.*

Proposed Strike of Gas Men at Chicago.

The gas companies of this city are expecting trouble among their employees on Monday, 16th inst., on account of a proposed reduction of wages by the North-side Company, which supplies the north and south divisions of the city with gas. A committee of the employees have notified the company that they will not submit to the proposed reduction of fifty cents per day, and the workmen of the west side threaten to side with them, if the wages of their fellow laborers are reduced. The companies assert their ability to obtain plenty of workmen at the reduced prices, and the police will prevent any disturbance.—*N. Y. World, Dec.* 15.

Chemical Repertory.

No. 82.—December 16, 1872.

EDITOR—HENRY WURTZ.

CHEMICAL EXCERPTS.

PHOTOGRAPHING THE EYE AND EAR.—Dr. Vogel writes to the Philadelphia *Photographer* as follows:

"That the interior of the human eye has been photographed is well-known. The experiment is a somewhat cruel one for a living subject; still there are victims who stand it. I know, for instance, a very handsome young lady, whose brother is a physician, who patiently takes extract of belladonna until the pupil has become sufficiently enlarged; the interior of the eye is then illuminated with magnesium light, and photographed. In a similar manner has the ear been photographed, that is to say, the tympanum only. A tube is inserted, in which is a mirror, inclined at a certain angle. The mirror is also provided with a central hole, through which the illuminated tympanum can be inspected. A system of lenses projects an image on the sensitive plate, and the picture is made in the ordinary manner.

569. THE FRENCH ACADEMY AND DARWIN.—Chas. Darwin having applied for admission to the French Academy of Sciences, was rejected by a large majority. The reasons given for his rejection were solely scientific. M. Moigno said "the Author of the Origin of Species" and "The Descent of Man," has too far sacrificed science to renown and reason to imagination, to deserve a place in the first rank of earnest scientists. * * * He has fallen too low, especially in his last work, has too much belittled himself not to be made to expiate it. * * * In closing itself against Darwin, our Academy of Sciences desired to protest energetically against the abuse which has been of his doctrines, by such men as Clemene, Royer, Hoeckel and Vogt."

570. ORGANISMS IN ROCKS.—Dr. Jenzsch, of Gotha, who has devoted himself for some years to microscopic lithology, announces than in various kinds of crystalline and volcanic rocks he has discovered minute animal forms in prodigious numbers in a fossil condition Among them he finds infusoria and rotiferæ intermingled with algæ, and he infers their formation in a large expanse of stagnant water.

571. PLANT-PHOSPHORESCENCE.—The Rev. M. J. Berkeley describes, in the *Gardeners Chronicle*, a very remarkable instance of luminosity in fungi It occured in the mycelium of an unknown species growing on a trunk of spruce or larch, and was so powerful as to make a perfect blaze of white light in the track where the trunk has been dragged, and vividly illuminating everything in contact with it. It gave almost light enough to read the time on the face of a watch, and continued for three days.—*Sci. Am.*

572. ALCOHOL FROM SAWDUST.—Into an ordinary steam boiler, heated by means of steam, were introduced 9 cwts. of very wet sawdust, 10·7 cwts. of hydrochloric acid (sp. gr.=1·18), and 30 cwts. of water; after 11 hours' boiling, there was formed 19·67 per ct. of grape sugar. The acid was next saturated with chalk, so as to leave in the liquid only a small quantity (½° by Ludersdorf's acid areometer); when the saccharine liquid was cooled down to 30°, yeast was added, and the fermentation finished in twenty four hours. By distillation there were obtained 26·5 liters of alcohol of 50 per cent. at 15°, quite free from any smell of turpentine. and of excellent taste. It appears that the preparation of alcohol from sawdust may be successfully carried on industrially when it is precisely ascertained what degree of dilution of acid is required, and how long the liquid has to be boiled. When all the cellulose present in sawdust might be converted into sugar, 50 killogrammes of the former substance would yield, after fermentation, 12 liters of alcohol at 50 per cent.—*M. Zetterlund.*

573. THE OXYHYDROGEN EXPERIMENTS.—Whatever may be the final judgment of the scientific world, the New York *Daily World* has made up its mind, or what it is probably "pleased to call" such, about oxyhydrogen; as thusly:

"One satisfactory result has been gained from the experiments at the Fair of the American Institute, and that is the one attending the trial of the oxhydrogen gas. It has proved that during the month of October in using 372 oxhydrogen burners in place of 2,400 of the ordinary sort, from 50 to 75 per cent. more light was supplied at an economy of more than 25 per cent. The Department of Public Works has made a requisition on the Company to furnish the light to be used at the stand at the upper end of Union square, to which point they are laying their pipes.

574. COLD VICTUALS.—During the past summer, it is stated that there were in daily use on the Michigan Central Railroad 51 cars fitted up expressly for carrying butter, beef, and eggs from Chicago to Boston and New York. An average of four of these cars started each day, and were inspected and re-iced at Detroit before they went further. Each car consumed four tuns of ice on the trip.

Another item, looking likewise, has appeared within a few weeks (Nov. 24).

"The steamer Francis Wright has arrived in Philadelphia from Galveston, Texas, with a cargo of beef and fish. During the voyage a flue of the boiler which drives the refrigerating machinery exploded, and the heat, entering the refrigerator, completely spoiled the entire cargo."

Better luck next time, we trust.

575. GAS-COOKERY.—Our *confrere* the *Coal and Iron Record* comes quite up to the mark on this subject, and we congratulate him on his state of *advancedness*:

"There are many obvious advantages to be urged in favor of this method of preparing our daily food. In point of economy in the first outlay, preference must be given to it, and the continued saving of expense is all in its favor. Neatness, handiness, and labor-saving may also be urged in its behalf. Late improvements have been made in the construction of gas apparatus for cooking, some of which we shall take occasion to notice from time to time. That there will be an active rivalry between the cooking-stove range and gas-cooking men for years to come, there can be no question, and it will be observed with a considerable degree of interest by those who 'read, mark, and inwardly digest.'"

As most all, who are not too dyspeptic to digest at all, do that same *inwardly*, this is tolerably comprehensive.

576. AIR GAS LIGHT IN ENGLAND.—Under the above head the *Scientific American* has an item:

The "Air Gas-Light Co., Limited" is the title of a new bubble in the speculative share line, now extensively puffed in the London papers and said to be having success. Several prominent names are connected with the scheme. The air gas is made by passing air through a suitable hydrocarbon liquid, such as naphtha. This method, as our readers know, has for years been in common use in this country. But in England this plan is, practically, almost unknown, and the "Air Gas-Light Co., Limited," are astonishing the natives with the light, and are also unloading their stock shares as fast as they can find purchasers simple enough to buy. The air gas "epizootic" had a good run in this country; but speculation therein ceased a long time ago. A reasonable, steady, and extensive branch of industry is now carried on, in this line, all over the country. For country dwellings, stores and churches, the air gas furnishes excellent illumination at a small cost.

[The naphthalization of air, to convert it into an illuminating gas, was originally the invention of an English chemist, Charles Blachford Mansfield, in 1847, who met his death thereby.—ED.]

577. COAL IN INDIA.—India, with respect to the superficial extent of its coal, stands fourth in the catalogue of countries, the United States heading the list with an area of 500,000 square miles. A proximate

estimate for India gives 50,000 square miles. These figures for the two countries, however, do not convey a true idea of the relative amounts of coal, for the average thickness of coal in the Indian fields is very much greater than that of the fields of the United States, and it will probably found that India will not be surpassed by any country in the world for actual quantity of coal.

The most extensive fields are those of the Central Provinces and Nizam's Dominions, and Assam, but the best known are those of Bengal. The Godavery and Waidha field of the Central Provinces is alone equal to the total productive coal area of England. Extensive fields occur towards the southwest frontier of Bengal, and a series of coal basins extend in a band between the 20th and 25th parallels of N. latitude from Calcutta to more than half-way towards Bombay. Some of the coal seams are of enormous size; many exceed 40 feet and 50 feet, while a few range to 100 feet, and even more.—*London Mining Journal.*

578. "PRICE'S GLYCERINE."—In a report of the chemical products at the Dublin Exhibition, the *Chemical News* promulgates some puffery which we scarce think will be patiently accepted by other manufacturers of glycerine throughout the world:

"All chemists must look at Messrs. Price & Co. with respect as the originators of pure glycerine, and the promulgators of a great chemical fact. Although distilled glycerine is now extensively manufactured abroad, the originators hold the palm as regards quality. This is mainly due to the fact of its great freedom from acrid products of distillation, which give a disagreeable odor to the glycerine if nothing worse. Glycerine can be, and frequently is re-distilled by the aid of superheated steam. Very inferior glycerine is now in the market, but its genuineness is so easy of detection, that we are surprised to find such inferior qualities are sold at such a high price. Pure glycerine should not give a white precipitate with nitrate of silver," etc., etc.

579. FROST AND SMOKE.—We learn from the *Am. Artisan* that a congress of vine-growers has been held this autumn in the south of France, whose members, before separating, tried a most interesting experiment. This is a plan to counteract the destructive effects of frost—which, at certain critical periods, is fatal to their crops—by the creation of clouds of warm smoke, which shall hover over the ground. Iron vessels, containing a preparation principally of tar, having been disposed at intervals over the vineyards, were set fire to, and produced thick clouds, which hovered over the land and spread for miles around. An important point in the plan is its cheapness.

580. WHICH IS WHICH?—In our last issue, p. 187, we were inconsiderate enough to copy an item that was swinging around the circle of our "reliable prints," recounting a terrific gas explosion at the Brooklyn Navy Yard. It may be as well therefore that we put in also the *later* version, though we have not the least idea which of them, or whether either of them, has a word of truth. To our readers, therefore, many of whom are readers also of the reliable aforesaid, we can but say, with the showman, "whichever you like, my little dears, you pays your money, and you takes your choice":

"The reported explosion of gas at the Navy-yard on Saturday was a mere sensation, a leak only in a gas-pipe having been discovered, and the vapor being ignited by the person in search of the escape, slightly scorched the whitewash on the adjacent beam. There was no explosion, nor was even a pane of glass broken in the building."

581. AMMONIACAL LIQUORS.—We observe a report of a very recent patent issued to H. H. and C. J. Eames, as follows:

"The nature of this invention consists in the construction of an apparatus that will completely eliminate the whole of the ammonia contained in the aqueous matter obtained from the destructive distillation of coal and other substances. The object is to obtain, in a form of vapor, the whole of the ammonia and ammoniacal salts contained in the liquor by submitting thin stratums of the liquor to the action of superheated steam with lime-water, and passing the vapor through a stratum of sulphuric acid, thereby, by chemical action, forming a sulphate of ammonia. The action of the apparatus is continuous. It is well known that, in operating upon large quantities of liquids containing volatile substances, in order to eliminate such substances by the process of vaporization, it is possible to more completely and rapidly eliminate the volatile substances by acting successively upon small portions of the mass of liquid rather than by acting directly upon the entire mass; and this invention is calculated to thus facilitate the operation just referred to."

582. BRITISH MINES IN 1871.—From the official report, recently published, we learn that the total amount of coal mined was 117,439,251 tons, which required the labor of 370,881 men and boys. The number of fatal accidents during this period amounted to 826, resulting in 1,075 deaths, or one casualty to every 142,178 tons of coal mined, and one death to each 109,246 tons. The production for 1871 was something in advance of that of the previous year, which was 112,875,725 tons, although the number of collieries worked in 1870 was greater than that of last year by 42. The nature of the accidents in 1871 was as follows:

Explosions of fire-damp	269
Falls of coal and roof	435
Overwinding, ropes breaking, and other accidents in ascending and descending	41
Other shaft accidents	82
Miscellaneous, underground	176
Miscellaneous, at surface	72
Total	1,075

583. PENNSYLVANIA COAL MINE INSPECTION.—It appears that the preparation of the official reports on this subject is not put into the right hands. Dr. Buck, in the *American Exchange and Review*, gives a caustic review of the latest document. As a sample we quote a little of the trash which is palmed off therein for science, the subject being, *inferentially*, fire-damp.

"When, by exercise, the system is heated, the lungs require a larger supply of air to sustain it, and consequently consume and discharge large quantities of this noxious air, surcharged with ammoniacal pungency, which attacks the vital corpuscles of the blood. When carburetted hydrogen gas is present in the mines, these sporey particles have a greater affinity to oxidation and poison. When this sort of air explodes, its temperature is increased to some 1,500° of heat, and will expand to 1,700 times its volume; blood-heat at 98° receives 1,400 per cent. of a suddenly heated charge; the lungs are suddenly distended by this expansion, and so sudden is the action of the heat and pressure on the subject, that the system is incapable of resisting the violence of the shock. The poison distilled into the blood by this action corrodes the sensibility of the flesh and blood, and destroys the organization of the fleshy textures of the anotomical elements of the injured parts, and utterly subverts the re-formation of genuine flesh."

This must be the origin of the "chimera-ruminating in a vacuum" that we have all heard of. Seriously, the actuality, not the mere possibility of such maudlin stuff as this passing current in this country for science, should make the Americans blush.

584. QUITE TIME.—The *Coal and Iron Record* tells us that the destruction of timber in America is at last attracting public notice, and is likely to become a matter for legislative enactments. The railroad companies should be obliged to reserve alternate sections of forest lands for all time, if only narrow strips along their lines. California has already created the office of State Forester.

585. SUCRATE OF LIME AS MUCILAGE.—The *Journal of Applied Chemistry* says that this compound has been found to have the properties of mucilage, and a coat of it possesses gloss and firmness. If we soak three parts of glue broken in small pieces in 14 to 15 parts of this sucrate of lime, then on warming it the glue dissolves rapidly, and remains liquid when cold, without losing its strength, as glue does when treated with acid. Glue of any desirable consistency may be prepared by varying the amount of sucrato of lime added. The thicker glue keeps its muddy color, the thin becomes clear on standing.

Gelatine dissolves in this solution of lime and sugar without previous soaking; even old gelatin which has become insoluble in hot water is soluble in this compound. This glue has great adhesiveness, and admits of very many uses. It cannot, of course, be used on colors that are injured by the lime, as, for example, chrome yellow, Paris blue, zinc green, Behringer's green and carmine. Ponceau made from carbolic acid is changed into a beautiful carmine color. When warming the glue to dissolve it, a strong smell of glue is given off, but this is destroyed by a few drops of oil of lavender. A small admixture of 2 to 3 per cent of glycerine is also an advantage. Carbolic acid acts upon the lime when the glue is exposed a long time to the air, producing little white specks, without, however, affecting its adhesive and preservative power.

586. OPTIMISTIC.—The *Pulse of Health* says, in relation to, and deprecation of, what it calls "Sensational Hygeine":

"Certain facts are so patent—as, for instance, that the present cookery is far better than that of twenty years ago; our clothing warmer in winter, cooler in summer, and every way more sensible than that of the last generation; our modern houses incomparably more convenient and comfortable than those they replace; our habits of life, in every essential respect, more healthy, cleanly, and refined than those of any other nation or age; and, finally, as the direct outcome of these improved conditions, the average of life is so steadily increasing—these facts are so obvious and pertinent that the necessity for exaggeration, dogmatism, and sensational half-truths concerning hygeine, if such necessity ever did exist, certainly exists no longer."

587. PESSIMISTIC.—Dr. Dudwig Buchner, in his recent lectures here, while giving in his adhesion to Darwinism, took a widely different view, nevertheless, from that usually put forward, with regard to "development." He is represented as having "characterized the hypothesis that man is a descendant of the monkey and the ape as absurd. The higher classes of monkeydom—the gorilla, the chimpanzee, and ourang-outang were, he said, only our cousins, and there was some satisfaction that these ugly animals were not our ancestors. But there was no doubt that they descended from the same ancestor who was the forefather of man."

In other words, though monkeys have not developed into men, men must have deteriorated into monkeys. We do not altogether realize the "satisfaction" that is set forth as arising from a faith in such possibilities.

New Gas Works at Montreal.

On Monday, November 25th, the members of the Light Committee of the City Council, and the Mayor and other members of the Corporation, together with the members of the press, on the invitation of the New City Gas Company, visited the works in progress at Hochelaga, and afterwards the old works in Griffintown. With reference to the new works at Hochelaga, we have obtained the following facts:

The erection of the extensive works which the company propose to establish and supplement with additional buildings as the requirements of the city may need, has not proceeded as yet much beyond the raising of one range of buildings. This range covers a length of 270 feet with a width of 53 feet, and comprises buildings for engines and exhausters, boilers, scrubbers, station meters and governors, and workshops. Among the other important portions of the work are a retort house, built and being covered, which serves to represent the large scale on which the company have commenced operations. When brought into full operation it will be capable, we are told, of

making more than one million and a quarter cubic feet of gas per twenty-four hours. This is a surprising step in advance of the power of the present works. the new retort house representing twice and a half times the company's power. The first constructed gas holder will have a diameter of 100 feet, and will hold no less than 375,000 cubic feet of gas. This holder will be supplemented, however, at a later date, by two more tanks of similar dimensions. It is computed that a reserve of equal to the maximum make during twenty-four hours, is fully sufficient to meet any contingency which might arise, and this reserve will be held in the new gas holders when completed. The tank already built, in itself exceeds the whole storage capacity of the old works, which amounts to only 308,000 feet. Nevertheless, the old tanks will be used in conjunction with this enormous holder until such times as the new works are brought into full operation.

During the winter it is intended to erect much of the iron work, which is already on the ground, and to proceed with retort building and similar operations. In this way it is hoped to place the new works in working order during next summer, when the new and old works will be carried on together for some time afterwards.

Messrs. Laidlaw & Son, Glasgow, supply all the apparatus. Messrs. Laberge & Son are the contractors for the masonry connected with the gas holder, retort house, and other portions of the works. Mr. Holmes is entrusted with a contract far roofing and carpentering.

The engineer, in answer to inquiries respecting the illuminating power of the gas at present supplied to the city, said it necessarily varied, but generally equalled 15 or 16 sperm candles. He had great difficulties to contend with at the old works, and about a fortnight ago the purifying apparatus broke down, and some foul gas went into the city pipes. That, however, had since been remedied. He anticipated that the illuminating power will be increased when the new works are brought into operation. The old works had failed to make the necessary quantity of gas, and in order to meet the requirements of the city during the winter, a number of new retorts had been built, and other additions made to the apparatus. With the aid of these improvements, the engineer hopes to provide the city with an adequate gas supply during the next five months when, as is well known, greater demands will be made upon the gas works than at any other time of the year.

After going through the various buildings and inspecting them, the company proceeded to the old works at Griffintown, and after an examination of these, repaired to the lunch room of the company's office, where a sumptuous repast was provided. The usual toasts were drank and speeches made, after which the company separated, well pleased with the evidence they had witnessed of an earnest determination on the part of the company to afford a better supply of gas to the city of Montreal.—*Gazette.*

The Gas Company of Yokohama, Japan.

[We get the following from the *Japan Mail*, of Oct. 23, 1872:]

Most of our readers are already aware that the pipes for supplying gas to the residents in the native town have, within the past few days, been laid in the principal streets. At this time, then, it may be not inopportune to lay before our readers a short description of the gas works now almost complete.

It will be remembered that the plant necessary for the manufacture of gas was imported in the ill-fated steamship Sadkia, and since July 1st the men have been at work day and night in order to be able to supply gas to the native town during the present month. That object will be achieved, for though, despite the strenuous exertions of all concerned, it will be impossible to supply gas in time for the inauguration of the railway and the visit of the Mikado, ten days later will see Basha-Michi, Benten-Dore, and one or two other streets properly lighted with gas. It is to be regretted that the visit of the Mikado and the inauguration of the gas works cannot be simultaneous; but the sinking of the main pipe in the bed of the creek opposite the railway will take so long a time as to preclude the supplying of gas before the 20th or 21st of the current month.

The gas works themselves stand in a plot of ground 300 feet long by 200 feet in depth, on the other side of the creek, but parallel with the railway station. On this area are all the necessary buildings, which consist of a distillation house built of stone and brick, and roofed with corrugated iron, a tile and plaster building 108 feet long by 33 feet wide, various godowns for the storing of material, coal, etc., workshops, forge and a dwelling-house for the European engineers.

The retort-house is 112 feet long by 32 feet broad, and contains two benches of furnaces, each comprising four furnaces, with five retorts to each. These are in two rows, each on either side of the chimney with which they communicate; are built of brick made in Yeddo, and are some some 12 feet high, being of a most substantial character. We need here only describe one, since each is an exact counterpart of the others. The furnace is, we have said, of brick, made in Yeddo by Japanese, and above are five clay retorts imported from Glasgow, 10 feet in depth, and with iron mouths closed by screw flanges.

Such are the principal features of the gas works, and after a careful inspection it cannot be denied that every arrangement is thoroughly satisfactory and does Mr. Pelegrin, the engineer in charge, to whom we must tender our thanks for the information he courteously favored us with, every credit.

We may now pass outside the works and briefly examine the operations of the company in the public streets. The gas is supplied by a Japanese Company, and, as a matter of course, the native town is to be illuminated first. The main-pipe, which is 18 inches in diameter, runs from the works across the creek on a raised bridge, then parallel to the railway station to the creek, which it crosses below the bed, and thence to the Basha-Michi, Honcho-Dore, and up the Main street to the Police station. So far as has already been laid, but before Christmas it is intended to lay a main pipe up the Main street as far as No 79, thence to the Homura road and across the creek to the Bluff, while the other streets will be supplied by small pipes, as also will the suburbs of the native town.

There are according to the present arrangements, to be 267 public lamps in the native town, without the suburbs, and 135 in the foreign settlement, without the Bluff, the use of one furnace and five retorts only being sufficient to supply the consumption at the outset. The arrangements for lighting the native towns are complete; the public lamps will cost $4 a month each, while the consumers will be charged $3.50 per 1,000 cubic feet. We understand that the prices will be the same in the foreign settlement; but nothing has been yet settled, though a preliminary committee of six gentlemen has been formed for the purpose of bringing the matter fully before the public. The company is willing to carry the supply pipes through the streets before Christmas, and it is to be hoped that something will be done to ensure our having gas as soon after that as possible.

In conclusion, we can only repeat what we have said before—that the works are in every respect satisfactory. When everything is complete the expense will only be about $105,000, and, considering the great expense of importing the apparatus, this cannot be considered extravagant. The rates charged to consumers will doubtless prove fairly remunerative, and the Company will reap its reward in the almost universal consumption of its manufacture.

Peat Fuel for Iron Furnaces.

No other bad cause ever received the persistent puffing which peat fuel for use in furnaces has had. Attempts to use it were begun a century or two ago in Europe, and have been continued with remarkable persistence ever since, in nearly every country, under circumstances the most favorable to success, and with all this labor, peat as a fuel, stands just where it did in the beginning. But failure has not lessened the ardor of its advocates. Papers, called scientific, urge its use; men with money go on experimenting; railroads try it again and again, and although not one established success is recorded, and though the inconvenience, cost and waste have been well proved, the whole subject is still under investigation, just as if it had never been tried. We acknowledge that this is the way to obtain success if such a result is possible. We admire, too, the gallantry of these knights of the bog, and we know very well that the best expert, educated by long experience and the knowledge of innumerable trials, to disbelieve in peat, may have his confidence in his own mental integrity momentarily staggered by the unconditional assertions of his opponents. We offer the following as a proof of what we have said as to the persistence of the peat men, premising that this is but one phase of what seems to be a decided revival of the oft exploded peat bubble:

The little peat furnace near Ishpenning, Lake Superior, is again in order, and is, we presume, in blast by this time. It is the intention to use for fuel 75 per cent. of peat and 25 per cent. of charcoal. The result will be looked for with intense interest. If the experiments which are being made at this furnace shall demonstrate that peat fuel can be successfully used in blast furnaces, new iron centers will spring up, the production of pig iron will be increased, and the present high price of the article will be reduced—then, perhaps, we can send our "pigs" to markets across the water, and beard the British lion in his den.

We agree entirely with our contemporary. If the experiments succeed the British lion won't have a hair left in his hide, to say nothing of his chin. More than that, the number of national animals who will stand on foreign shores and howl at the American Republic, will be great enough to form a menagerie that will rival Mr. A. Ward's snake show.—*Eng. and Min. Journal.*

Prof. Chandler, on Fire.

From an interesting lecture at the Stevens Institute by this gentleman, we quote the following passages:

The greater part of the discourse was devoted to the means of preventing fire.

STATISTICS OF FIRES,

recently compiled, show that $76,000,000 was lost through isolated conflagrations in the United States, Chicago and Boston not being considered, within a space of two years. Investigations into the causes show that although the largest number of fires was due to incendiarism, no less than 12 per cent owed their origin to accidents with kerosene. Examinations, made by the Fire Marshal of New York city, also proved that 18 per cent of the fires occurring within the limits of one year were due to a similar cause. He stated that

KEROSENE

sold in the city is unsafe, and instanced how he purchased 700 samples, out of which only 28 were not dangerous, and 37 were extremely bad. A very lucid description was given of the method of testing the oil, and the varieties of apparatus used were exhibited. The flash point and not the burning point should be considered, as, of course, the vapor of the oil must ignite before the liquid can kindle. One hundred degrees Fahr. was stated to be the commercial standard for the flash point, but Dr. Chandler considered that this should be raised to at least 130°, so as to preclude all possibility of the oil arriving at the flashing temperature while in the lamp. A strong denunciation was delivered against the manufacturers who sell unsafe kerosene and thus imperil human life. It is a common trick ts delude customers by setting a little of the oil on fire in their presence to prove that it is non-explosive. If kerosene ignites at ordinary temperatures, it is a sure sign that it is extremely dangerous. The oil never in any case explodes, bu

its vapor when mixed with air does so. Kerosene which is almost pure gasolene is now sold in New York. One variety is known as "Safety Gas," so called to evade the law. It is sold by one Smith, at No. 40 East Broadway; (we give the individual the benefit of the gratuitous advertisement). To prove the inflammability of this compound, the lecturer poured a little on an old coat hung on a frame. On touching a light to the garment, it instantly burst into a fierce blaze, which continued a sufficient time to burn the wearer, if any there had been, to death. This oil was stated to be as dangerous as gunpowder, and should never be used. The properties of a really safe oil were then explained, and samples of various kinds shown. Among others were the products of several well known firms, the best being mineral sperm oil, which Dr. Chandler stated flashed only at 250° Fah., and was practically as safe as whale oil. Taking a specimen of this liquid, he heated it to a temperature of 212°, lit some cotton waste saturated with it, and actually extinguished the flames in the boiling oil. The same material, when poured on a garment, could not be ignited. Good oil is necessarily more expensive than the inferior qualities, but the very best only costs one half cent per hour, while the worst cannot be sold at a lower rate than one quarter of a cent, for the same period.

LAWS REGARDING THE USE OF OIL

should, said Dr. Chandler, be rigidly enforced; and he called attention to the late English enactment on the subject. The various state laws hitherto passed are virtually inoperative, their principal defect being that their execution is left to inspectors, who can be approached and so caused to neglect their duty. Selling or making dangerous kerosene should be legally made a crime, punishable by heavy fine for every offence. In case human life is sacrificed, the manufacturer should be indicted for manslaughter. Inspectors should be abolished, and the evidence of every citizen taken as competent to prove the manufacture or sale of bad material.

CARBONIC ACID AS A PREVENTIVE.

Dr. Chandler alluded to a company which at one time was started in this city, for the purpose of introducing carbonic acid gas through pipes into all the houses, so as to have a means of extinguishing fire, ready at hand. This, he said, would be extremely dangerous, because in event of a leak in the pipes, the same could not be discovered, and the escaping gas would suffocate the inmates of the dwelling. It was proposed at one time to compress this gas into a liquid, and furnish it in iron casks to vessels, so that, when there was danger of fire, the gas might be set free.

FIREPROOF BUILDINGS.

Mansard roofs were strongly condemned, and also the practice of using inflammable materials in buildings. Pine wood is so cheap in this country that it is employed for house carpentry almost to the exclusion of other kinds, while it is the most dangerous in existence. Dr. Chandler then proceeded to explain the French mode of building, which he said was almost absolutely fireproof. Floors consist first of a number of thin iron beams, much thinner than are used in this country, placed some two feet apart. Across these are laid 4 number of rods of hoop iron, and across these again more of the same material, until a net work with interstices of about a foot in size is formed. A flat platform is then brought up underneath, and liquid plaster is poured over. As soon as this sets, the platform is removed and the floor remains, a solid mass of plaster and iron. Walls are constructed after a similar fashion; a few light scantlings are put in position to give shape and, boards being temporarily placed on either side, liquid plaster is poured in and allowed to harden. All walls and floors therefore are perfectly solid, and consequently fireproof. Dr. Chandler then gave a very entertaining account of a fire in the Palais Royal, in Paris. He said that the inmates of other parts of the house did not manifest the slightest unconcern nor move a single article. Of the Paris Fire Department he gave an amusing description, saying that it was but a single garden engine and a line of men passing buckets. This, though seeming ridiculous at first, really showed the sense of the people, who, instead of paying immense sums for an elaborate organization, spend their money in rendering their houses incombustible. A fire in one room in a French house spreads no further. It is only necessary to close the doors and let the articles contained in the apartment burn up. No other damage can be done.

In great cities every house should be, by law, fireproof. Our so-called fireproof warehouses are manifestly easily consumed, a fact shown by the immense number of windows which are always constructed in them, and which offer no resistence to the fierce blasts of hot air from an adjacent burning edifice. All windows should be provided with iron shutters, not swinging, as these are easily curled up by heat, but enclosed and sliding in the wall. Shutters should, however, be double, so as to leave an air space between them.

Steam Boiler Explosions.

At the recent meeting of the British Association, Mr. W. F. Barrett read an interesting paper upon the conditions affecting the spheroidal state of liquids and their possible relationship to steam boiler explosions. It appears, in brief, that he has found that the presence of alkalies or soaps in water quite perceptibly aids in the production of the phenomenon of the spheroidal state. He relates as one experiment, which first drew his attention to the subject, that having occasion once to cool a red-hot copper ball, he plunged it into some water in which he had just washed his hands. He states that, to his surprise, the ball entered the water without hissing and without visible evolution of steam, and on being removed was apparently as hot as before. This accidental observation led to experiments, with a view of ascertaining the causes of this curious phenomenon, since it appeared impossible that the spheroidal state could be maintained with water by a body at so low a temperature. Fresh water was tried but with a different result. The ball, upon immersion, evolved a loud hissing sound, and gave off a copious discharge of steam. By adding a little soap to the water, he was enabled to reproduce the phenomenon at first observed, the ball entering the liquid quietly. Albumen, glycerine, and organic substances generally produced the same results. The best method of reproducing the phenomenon, the author says, is to make use of a soap solution mixed with water, and to plunge into this a white-hot copper ball about two pounds in weight. The ball enters the liquid smoothly and quietly, and glows while hot at a depth of a foot or more beneath the surface. Even against so great an hydrostatic pressure, the ball will be surrounded with a shell of vapor perhaps an inch in thickness. The total reflection of the light from the bounding surface of the vapor bubble surrounding the glowing ball, gives to the envelope the appearance of burnished silver, making the experiment quite an interesting one. As the ball gradually cools, the bounding envelope becomes thinner, and finally collapses altogether, followed by a loud report and the evolution of large volumes of steam. From the facts elucidated by his experiments, the author makes the suggestion that the traces of oil, or other organic matters which find their way into a steam boiler, may similarly produce a sudden generation of steam sufficient to account for certain problematical explosions. —*Amer. Exchange and Review.*

Bi-sulphide of Carbon for Extracting Oils.—F. Fischer states that in Gottschald's oil factory where 30,000 cwt. of oil seed are extracted, the workmen do not suffer from headaches, and that in extracting 100 kilos. of seed only half a kilo. of the bi-sulphide is lost. Even this loss he thinks is due to decomposition, the sulphur set free attacking the vessels, especially those of copper.

Gas Lighting by Electricity.

A new patent gas apparatus for the instantaneous lighting or extinguishing of gas lamps, has just been successfully tried at Preston, England, and is thus described in the *Engineer*: "The apparatus constituting the invention looks like a moderate sized globular inkstand of glass, surmounted by a tube of the same material, with a metallic top; and by screwing off the burner, it can be very easily attached to any lamp, chandelier, pipe, or ordinary gas jet. The base or globular portion is filled with a deep red colored liquid —a simple chemical mixture, with no combustible properties, almost without smell, and so cheap that three pennyworth of it will serve one lamp for twelve months. Over this liquid and within the glass tube, there is a plate of zinc, along with a piece of graphite or gas coal, and, between those and a thin coiled platinum wire fixed over the cap of the general vessel into which a gas burner is inserted, galvanic communication is obtained. A pipe, to be screwed to that which the ordinary gas supply flows, runs through the base of the vessel to about the center of the surmounting tube; pressure brought to bear upon the gas in this pipe causes, by small collateral openings, a simultaneous depression upon the chemical solution which occupies a lower level in two side tubes; the gas occupies the vacuum caused by the displaced liquid, and then ascends to a chamber in connection with the burner; while the displaced liquid is pressed into two side tubes effecting contact with the zinc and graphite, generating galvanic activity, which is communicated to the platinum wire, and excites the catalytic power of the wire, which, when exposed to the ascending jet of gas, results in immediate, almost instantaneous, ignition. Each lamp requires one of these appliances; but, as stated, they are cheap, and the price of the requisite liquid may be termed nominal. The apparatus is virtually self-acting; it requires no skilled hands to superintend its operations; it may be attached by a novice; it may be replenished at any ordinary chemist's shop for a few pence per year; it needs nothing but fixing, and then being subjected to the simple action of gas pressure."

The idea of attaching a separate galvanic battery to each gas burner, for the purpose of igniting and extinguishing the gas, may be novel, but certainly it is complicated. The method now extensively in use in this country is much better, and is as follows:

A galvanic battery is placed in the cellar, attic, or other convenient portion of the building, from which wires extend to the gas meter, and also to each gas burner, over the orifice of every one of which a fine platinum wire is arranged in such a manner as to form a part of the electric circuit.

In connection with the battery and wires, two or more telegraph keys or buttons are employed, placed wherever convenience requires. By touching one of the keys, the electric current is made to operate a magnet and lever which is attached to the gas cock, whereby the latter is turned, and the gas either let on or shut off. By touching the other key, the electrical current is made to pass through the several platinum wires on the burners, thereby almost instantly heating the platinum up to a nearly white heat and igniting the gas. It is a pretty sight to witness the sudden ignition of the jets of a large chandelier in this way. This plan of lighting, first practically applied by Prof. Samuel Gardner, is employed for lighting the great dome and other apartments of the Capitol of Washington. Stewart's store and dwelling, and Booth's Theater, New York, and in fact hundreds of buildings, public and private, in various parts of the country are electrically lighted in this manner, and success of the system will now make its employment general.—*Scientific American.*

Experiments on the Simultaneous Lighting of Lamps.—Some experiments were made at Preston a fortnight ago with Klinkerfue's "Hydrostatic-Galvanic Igniter." We made a brief allusion to this invention some months since, and may shortly give a detailed description, with illustrations, without which

a description would hardly be intelligible. It has been patented in England by Mr. J. B. Booth, of Preston. The apparatus consists of a glass vessel, in which is contained a galvanic pair of zinc and graphite, the poles of which are two small brass rods, carried a little above the burner, and connected by a spiral of platinum wire placed across the burner. The gas is conveyed to the vessel by means of a tube in the center, closed at the top, and placed within another wider tube, which again is put within a third, which leads to the burner. The exciting liquid is a solution of bichromate of potash in dilute sulphuric acid. Sufficient of this is placed in the vessel so that when the gas is at the minimum pressure the level of the liquid stands above the opening of the middle tube, thus forming an hydraulic valve, which prevents the passage of gas to the burner. When, however, the pressure of gas is increased the liquid is depressed in this tube (so allowing the gas to pass), and forced up in the outer vessel, when, reaching the zinc (the carbon being already immersed), a galvanic current is established, the platinum spiral is rendered white hot, and the gas can be lighted simultaneously over a whole city. The experiments at Preston are reported to have been very successful.

Calorific Powers of Lignites.

Scheurer-Kestner and Meunier—The authors have examined, on previous occasions, the coals of different basins, and have now made a series of experiments on lignites and pure cellulose with a view of forming a comparative series with the results obtained. The authors found it difficult to determine the calorfiic power of cellulose (they employed cotton chemically cleansed) by reason of the empyreumatic products which obstructed the coil of the calorimeter, and they were able to finish completely only one combustion. From the results obtained, however, they concluded that the calorific power of cellulose approaches that obtained according to the law of Dulong; that is to say, that cellulose (C_{12} H_{10} O_{10}) possesses the calorific power of its carbon (3590C.) the hydrogen being neutralized by the oxygen.

Lignites, according to elementary composition, have a calorifiic power superior to that of cellulose; in actual fact, the power surpasses, in general, that indicated by the calculation of Dulong; the excess, however, is very variable, and it is impossible to frame a general law from the results obtained; neither can one judge of the calorific value of a lignite by its elementary composition. Among the samples examined, there are those which contain much hydrogen (up to 6 p. c.) and little oxygen (15 p. c.), while others contain only 4·5 p. c. H. and 28 p. c. O.; however, it is the calorific power of the second which approaches more nearly the sum of the powers of the elements. The coals have, on the contrary, at least the 21 samples which the authors examined, a calorific power higher than the sum of the separate power of the elements.

The authors found, also, no relation between the composition of the material, considered with reference to its fixed and volatile portions, and its calorific value. The authors have given the figures, in detail, for six analyses. We append their own resume of the most important points. The last two columns contain the numbers obtained by calculating the calorific powers from the elementary compositions; the last column contains the sums of the powers of the elements; the numbers for the preceeding column were completed according to Dulong's law:

	Composition of Lignites less water and ash.			Calorific Powers.		
	C.	H.	O.	Observed.	Calculated.	
1.	76·58	8·27	15·15	7924	8343	8999
2.	70·57	5·44	23·99	7363	6533	7551
3.	66·31	4·85	28·84	6991	5782	7006
4.	72·98	4·04	22·98	6480	6295	7270
5.	66·51	4·72	28·77	6358	5759	6979
6.	67·60	4·55	27·85	6311	5827	7010

1. Fatty lignite of Bohemia.
2. " " " Manosque.
3. Dry " " "
4. " " " Rocher fleue of Fudeau.
5. Lignite passing into fossil wood.
6. Fossil wood passing into lignite.

—*Am. Chem.* T. M. B.

Correspondence.

[Correspondents, in all cases, should sign their communications with their names and address in full—not necessarily for publication, but as a guarantee of good faith.—Ed.

Strike at the Pittsburg Gas Works.

PITTSBURGH, PA., Nov 30, 1872.

Mr. Editor: There has been a strike amongst the men employed in the gas works here, occasioned by the removal of the Messrs. Neems (Engineer and Superintendent) this was found to be necessary from the fact that they—Supt. and En'gr—have been for some time throwing every possible obstacle in the way of certain improvements ordered by the President of the Company, D. Hostetter, Esq., such as station meter, clay retorts, exhauster, etc. When their removal became known to them, it is suspected they influenced the men to such an extent, by certain misrepresentations, as to cause them to "go out." The Company was equal to the occasion and at once appointed Jno. H. McElroy, Esq., late Engineer of the Water Works, to the position of engineer of the gas works. He at once organized with such unskilled labor as came along, and in a remarkably short time, by dint of constant attention and drilling, had an efficient corps of chargers and firemen.

The President of the company, Dr. Hostetter, remained at the works night and day, whilst any alarm was felt as regards the supply of gas to the city. The company had the assistance of R. Young, Esq., Supt. of the Allegheny gas works, L. M. Moyes, Esq., gas engineer, Wm. Gardner, Esq., gas engineer, and T. Baxter, Esq., superintendent of the East End gas works, who rendered efficient aid by supplying such skilled labor as was found necessary to keep the works running, until the "green hands" were broken in.

The city was at no time without gas, the only difference being a slight reduction of pressure. Everything is now going along smoothly.

R. H. Smith, our efficient Gas Inspector, has been reappointed. This gives great satisfaction to the "Gas Fraternity" in Allegheny County.

Trusting the above items may be of interest to those who have heard of the strike, I am yours, etc.

"EAST END."

Removing Tar from Gas Holders.

LOWER SYDENHAM, LONDON, S. E.,
NOVEMBER 14, 1872.

Mr. Editor: I notice in your Journal, just to hand, that in reply to Mr. Africa you suggest "hot lard' as a means of removing a coating of tar from a gas holder. Have you considered *the cost* of the hot lard for softening the tar on so large a surface as a gas holder—in addition to the cost of removing the softened tar? The cheapest and best way is to remove the tar with a steel scraper—one about twenty inches long, of five-eighths round iron, with a loop at one end, for the left hand to grasp, and the chisel end about two inches broad, will be found a useful size, the chisel end being kept to its work by the right hand—a man, after a little practice, can scrape several plates a day, taking the whole of the tar clean off, down to the iron. The plates when scraped should be painted to keep the iron from rusting. Gas holders should always be painted; coal tar is injurious to wrought iron. Yours faithfully,

MAGNUS OHREN.

Carbolic Acid Colors Not Poisonous.

MANCHESTER, ENG., November 9, 1872.

[We readily give space to the following letter, which has been forwarded to us, deeming it of sufficient importance to our readers.]

MAGNUS OHREN, ESQ.,
Lower Sydenham,
London, S. E.

Sir: We have perused copy of your letter to the AMERICAN GAS LIGHT JOURNAL, and in the first place must point out, that so far as we can ascertain, there is not the slightest ground for the statement that poisonous effect is produced from materials dyed with the "Carbolic Acid Colors." An impression that such is the case has evidently arispn from the fact, that articles of wearing apparel dyed with some aniline colors, produced an irritating and partly poisonous action on the skin, which fact being investigated, proved to be caused by the presence of *arsenic* in those colors.

As regards the effect of Carbolic Acid in our soaps, you may rest satisfied it is very much more *beneficial* than aught else, The increasing demand for same from nearly all parts of the world, is to us a sufficient voucher on that question. We are Sir,

Yours respectfully,
F. C. CALVERT & Co.

Explosion of a Gasoline Gas Works.

WINONA GAS LIGHT COMPANY,
WINONA, MINN., November 22, 1872.

Mr. Editor: On the 30th of October last, there was an explosion of a gasoline gas works in this city, by which the President of our gas works was killed. There has been a great deal of controversy as to what caused the explosion.

I sent you a paper containing an account of the same, at the time, but not seeing any notice in the last issue of the Journal, concluded you had not received it. I enclose you an account of the explosion, with some remarks and philosophical examinations mape by Prof. Phelps, Principal of our State Normal School. His description of the construction of the works and their condition, at the time of the accident are, I think, generally correct. Will you please give us your theory of the cause of explosion, in your next issue of the Journal, and oblige yours, etc.

J. H. JONES,
Secretary Winona Gas Co.

[We have received the paper alluded to, but want of space prevents our publishing it in this issue of the Journal. We will do so in our next.]

Glycerine for Gas Meters.

Glycerine, which is now so extensively used for filling gas meters, must be renewed after a longer or shorter use, owing, in the first place, to its becoming contaminated with ammonia, tar, acids, etc., which attack the metallic portions of the meter, und, in the second place, because of its absorbing water from the gas, which dilutes it and raises its freezing point, so that, after a time, it is no protection against frost.

In Dresden all the meters are filled with glycerine, which must be renewed from year to year. The glycerine, when put in, has a specific gravity of 18° B., and when taken out stands at 13° B. The quantity required is 30,000 pounds annually, for which the manufacturers, Scheering & Co., Berlin, charge two thalers ($1.50, gold) per cwt.; freight and other charges bring it up to nearly three thalers. To save this expense, Director Hasse, in Dresden, uses the following method of purification:

A small cylindrical boiler, set in masonry and holding about three cwt. of glycerine, is five-sixths filled with the impure glycerine, then slowly warmed to from 112° to 140° F., and kept some hours at this temperature. It is next heated to about 250° or 265° F., and kept there until the vapor, which escapes from the kettle by a small stop-cock, no longer contains either ammonia or acid, red and blue litmus paper being used in testing it. The temperature is now gradually lowered, and the liquid drawn out by means of a pipe attached to the bottom of the kettle. For removing the fatty impurities from the tar, a cylindrical apparatus, made of sheet zinc and filled with animal charcoal, is used. On the bottom of this cyl inder is laid a wire sieve, fastened on a little wooden frame, such as is used in making paper and sugar. On this 50 to 70 millimeters of bone black is placed. The correct size of the grains is ascertained by experiment; they must not be too small or too large, so that the glycerine may not run through too fast nor too slow. The filtering cylinder hangs on blocks made of wood. Under the filters are porcelain dishes,

with zinc saucers beneath them, so that when the dishes run over, the glycerine flows into the saucers, and out of these again into the vessel which is to receive it. The bone black is put in loosely, and slightly moistened. Hot water is then allowed to run through until it is no longer discolored by the small particles of charcoal. The glycerine diluted to 22° to 24° B., is then carefully poured in.

If pure white glycerine is desired, it is again passed through a fresh filter. It is then diluted to the desired density (in Dresden 18°) with distilled water, if possible. When the bone black ceases to act sufficiently, it is taken out and washed in hot water. After still longer use it can be again renewed by calcining in iron pots not tightly closed. The whole process of filtering is so simple that a workman can purify three or four cwt. in two hours. The cost per cwt. in Dresden is 12 silver groschens (30 cents).—*Jour. Applied Chemistry.*

Deep Boring in England.

So much interest was expressed in the description of the shaft boring at Mount Clair, Pa., as given at the Institute of Mining Engineers' meeting last summer, that we presume the following details of the method to be followed in making the sub-Wealden explorations in England will be acceptable:

"The apparatus contrived by Mr. Bosworth differs in some respect from that which is generally employed. He drives by steam a cutting tube, a sort of closed augur, at the end of an iron rod, weighted on the top, and fresh joints of rod are screwed on between the auger and the weight as they are required. The auger itself is about 2 ft. long; and it produces a perfect core of the strata through which it has passed. Mr. Bosworth has elsewhere carried boring to a depth of 2,000 ft.; and he exhibited on the 22d inst. some cylinders of rock that his augurs had brought up, rock so hard as to be almost polished by the friction required to cut it. When great depths are attained, the revolution of the rod at the top of the bore is not immediately communicated to the auger, but may be said to take time to reach it, so that the rod twists. Theoretically, each 20 ft. of rod makes a three-quarter turn before communicating the rotation to the portion below; so that every 100 ft. requires six complete revolutions at the top before the auger feels the movement.

The workmen soon learn to tell, by the sensation communicated by the rod to the hands whether the auger bites, and at a depth of 100 ft., if it did not bite on the completion of six, or, at most, seven or eight, revolutions, it would be pulled up and a faulty joint of the rod looked for and removed. In theory, of course, the six turns would be distributed over the whole length of the rod; but the iron is not perfectly homogeneous, and so, in practice, it is the weakest or softest part of the rod that receives all, or nearly all, the twist, and that would break if the twist were carried too far. Mr. Bosworth has contrived an ingenious device for seizing and dragging up the lower portion of the rod and the auger, if at any time the rod should break, but it is better and more economical in practice to anticipate a breakage, and to replace any portion of the rod that may twist instead of communicating the rotation. For the more surface soil the auger is 9 in. in diameter, but a 3-in. auger soon replaces the first, and in deep borings is itself replaced by one of 2 in. or of only 1 in. in diameter.

Fireproof Paint for Wood.

Dr. Weiderhold says that two substances have been recommended for this purpose: chloride of zinc and silicate of soda (soluble glass) both being generally well adapted to protect wood against combustion. As regards the chloride of zinc, the author states that, in case wood impregnated with it be exposed to fire, a most offensive vapor would be disengaged, which would make the surrounding atmosphere entirely insupportable by man. The soluble glass, on the other hand, is readily washed off in places not protected from rain an snow, and may therefore be of no value in cases of emergency. There are two older recipes, which have always been used with success. The one calls for the brushing over, twice repeated, of the wood work with a hot solution of three parts of alum and one part green copperas. When dry, it is to be coated again with a diluted solution of copperas, into which white pipe-clay has been stirred until the mixture acquired the consistency of a water color. This latter coat may be repeated once or twice. Alum and copperas penetrate deeply into the timber, and combine partly with the fiber, forming insoluble compounds which are not readily lixiviated. The coating of clay affords protection against excessive absorption of moisture, whereby freezing and washing out are prevented. It is evident that it will be advantageous to repeat the coat of clay from time to time. By the other method the wood is repeatedly brushed over with hot glue water, until it ceases to absorb it, which will be indicated by a coat of glue remaining on the surface. Now it is painted with a thicker solution of glue, into which, while yet semi-liquid, a powder consisting of one part sulphur, one part of ocher or clay, and six parts of sulphate of iron is sprinkled. These ingredients are, of course, to be well pulverized and mixed with each other. The author recommends these recipes from his own experience.

Points Decided Interesting to Inventors.

U. S. Circuit Court, District of New Jersey.

Samuel Wetherill *et. al. vs.* The Passaic Zinc Company, *et. al.*

[*In Equity.—Before Mr. Justice McKennan.*]

Construction of Licenses and Grants | Rights of Grantees under a Patent after it is Extended.

Held as follows:

A conveyance of buildings, machinery, etc., "with rights to use" certain patented processes, for working which they might be adapted, is a license to use the processes in those buildings only and not a general license.

Words restricting a grant of certain patented processes to such as the grantor "holds in his own right" are to be understood as meaning such as he holds for the benefit of others, and not those of which he owns only a part interest, and they pass under the grant.

A grant of all the patents which the grantor "now has, or has in contemplation to obtain," does not embrace the extended terms of those patents.

A license to use an invention "for the whole term of the patent which may be granted," given before the issuing of the patent, does not authorize the use of it under an extension of the patent.

The right to use a patented process during the original term of the patent does not, under the 18th section of the act of 1836 (re-enacted in 1870,) authorize the use of it after the patent is extended.

The grant of the right to use a patented process, and of apparatus which, though capable of being adapted to the process, was constructed to accomplish the same object by different means, does not, after the patent is extended, authorize the use of the process in the apparatus.

George Harding, for complainants.

E. W. Stoughten and Geo. Gifford, for defendants.

A Card from the Peoples' Gas-Light Company.

OFFICE PEOPLES' GAS-LIGHT COMPANY,
ALBANY, November 1st, 1872.

To Gas Consumers of Albany:

Thanking the general public for the consideration universally manifested while the principal business thoroughfares of the city have been temporarily disturbed by the laying of gas mains, the Peoples' Gas Light Company take pleasure in announcing the early completion of its works, and that it will commence supplying light on or about the 15th of December next. As the season for out-of-door work will then be far advanced, the Company desires to lay service-pipes and make connections with as many houses before that date as the time will permit.

Under the firm conviction that it can offer superior advantages to gas consumers, the Company has, at great outlay of money, established a complete gas-works, embracing all the modern improvements in gas-making apparatus and machinery, and for the operation of valuable processes of which it has exclusive rights for this county, by which gas is produced of much higher illuminating power than by any other known method applicable to the lighting of a city.

In arranging for the distribution of gas the company have spared neither labor nor expense in providing adequate means, its mains and conductors being of ample capacity to supply *any demand, at any hour*, that may be made upon them, *with an ever uniform and efficient pressure.*

This company will lay all necessary service pipes from the street mains into buildings, restoring all walks, walls, curbing stones, lawns or grounds, disturbed for the purpose, to the full satisfaction of all parties interested, *at its own expense*, and do the same as rapidly as practicable, with the least possible inconvenience or annoyance to occupants of houses so supplied.

Applications for services now, on the lines of pipes laid and for meters and supply of gas when the works are completed (say December 15th), may be made at the company's office, or to the company's representatives, supplying blanks therefor, or by mail. The season being far advanced, it is hoped that applications may not be delayed.

Richard Merrifield, President.

America to be the Workshop of the World.

Recent cable dispatches convey the intelligence that the cost of labor in England has considerably increased as a result of the successful nine-hour movement. English manufactures must, therefore, be proportionately advancing in price, and their power to compete with the products of our American mills and workshops be correspondingly lessened.

Little doubt remains that the foundations of England's superiority as a manufacturing country are gradually slipping away. The best coal beds have been worked down almost to the limit of profit, and the supply, if not already declining, is incapable of expansion, while the continued extension of factories and furnaces is increasing the demand at a rapid rate. The English iron-makers have long since been importing ores from the continent, and now it becomes necessary to eke out their supply of fuel by purchasing coal of Belgium. Their labor, too, is no longer so cheap as it once was.

The time is not far distant when the workshop of the world will be transferred to the United States, where not only fuel and iron ores exist in exhaustless quantities, but the greatest cotton fields are found, and nearly every great staple of raw material abounds. —*Manufacturer and Builder.*

The village of South Orange, New Jersey, is to be lighted with gas.

RECENT AMERICAN PATENTS.

Pertaining to the Specialties of this Journal, to date ending November 30, 1862.

131,814.—Carburator.—O. P. Drake.
131,740.—Purifying Illuminating Gas by Atomized Liquids.—B. E. Chollar.
131,737.—Steam Water Elevator.—W. Burdon.
131,865.—Turbine Water Wheel.—J. J. Faulkner.
132,025.—Carbureter.—J. F. M. Rigod.
131,943.—Carbureter.—H. G. Dayton.
132,103.—Gas Regulator.—R. M. Potter.
131,951.—Gas Stoves.—J. P. Hayes.

[*For continuation see page* 208.]

THE AMERICAN

GAS-LIGHT JOURNAL

AND

Chemical Repertory,

PUBLISHED ON THE 2D AND 16TH OF EACH MONTH,

At No. 42 Pine Street, New York.

A. M. CALLENDER & CO.,
PROPRIETORS.

EDITOR---PROF. HENRY WURTZ.
ditor's Private Office, 26 Pine St., Room 36.

THIS is a recognized official organ of—
LIGHT, HEAT, MINING INTERESTS, STEAM,
WATER-SUPPLY, PATENTED INVENTIONS,
VENTILATION, SANITARY IMPOVEMENT, AND
GENERAL CHEMICAL SCIENCE.

TERMS:

SUBSCRIPTION—Three Dollars per annum, in advance.

AGENTS:

NEW YORK—AMERICAN NEWS COMPANY, 119 and 121 Nassau St
BOSTON—S. M. PETTENGILL & Co., 6 State Street.
PHILADELPHIA—COE, WETHERILL & Co., Ledger Buildings, Phila.
Germany—B. WESTERMANN & Co., of New York.
Great Britain—TRUBNER & Co., 60 Paternoster Row, London.

☞ All communications to be addressed to "THE EDITOR, No. 42 Pine Street, Room 18, New York.

MONDAY, DECEMBER 16, 1872.

WISHING TO MAKE THIS JOURNAL an organ of intelligent discussion to those of our readers who may wish to gain or give information on the subjects to which its columns are devoted, the publishers solicit letters from all among them who make the study of these subjects a pleasure, or a profession.

Subscribers would confer a favor upon us by remitting *CHECKS*, or *POST OFFICE MONEY ORDERS*, as we are frequent losers where money is enclosed in letters.

☞ NEWS AGENCY.—The American News Company, 11 and 121 Nassau street, New York agents for this Journal. News dealers will please send orders to them.

NOTICE.

☞ *All Collections for Advertisements, Subscriptions, etc., are made directly from this Office. We have Agents to solicit the same, but they are not authorized to Receipt for Money.*

TO OUR SUBSCRIBERS AND PATRONS.

In making remittances for subscriptions, always procure a draft on New York, or a POST OFFICE MONEY ORDER, if possible. Where neither of these can be procured, send the money, but always in a REGISTERED LETTER. The registration fee has been reduced to fifteen cents, and the registration system has been found by the postal authorities to be virtually an absolute protection against losses by mail. ALL Postmasters are obliged to register letters whenever requested to do so.

CONTENTS.

☞ An asterisk (*) denotes an illustrated article.

Patent Four Side Moulding Machine.....199
Testing Steam Boilers—An Excellent Suggestion.....199
Our Iron Future.....200
Proposed Strike of Gas Men in Chicago.....200
Chemical Excerpts.....200
New Gas Works at Montreal.....201
The Gas Company at Yokohama.....202
Peat Fuel for Iron Purposes.....202
Prof. Chandler, on Fire.....202
Steam Boiler Explosions.....203
Gas-Lighting by Electricity.....203
Calorific Powers of Lignites.....204
CORRESPONDENCE.—
Strike at the Pittsburgh Gas Works.....204
Removing Tar from Gasholders.....204
Carbolic Acid Colors not Poisonous.....204
Explosion of a Gasoline Gas Works.....204
Glycerine for Gas Meters.....204
Deep Boring in England.....205
Fireproof Paint for Wood.....205
Points Decided Interesting to Inventors.....205
A Card from the Peoples Gas-Light Company.....205
America to be the Workshop of the World.....205
EDITORIALS—
Economical Use of Gas.....206
Purity of Water—Filtration.....206
Phenomena of Great Fires.....206
The Manufacturer and Builder.....207

[Sickness, resulting in death, in the immediate family of the Editor, has caused his continued absence during the getting up of this issue. Consequently, our readers may excuse the usual close attention to the editorial department.—PUBLISHER.]

ECONOMICAL USE OF GAS.

It is a fact which cannot be controverted that consumers of gas are, as a general rule, extravagant in burning it, and that this extravagance grows insensibly, until at last, on present bills being compared with those of former years, the discrepancy is plainly visible. Then complaints are started, and accusations made against the companies, which frequently give rise to dispute and animadversions of the most unpleasant nature.

If the meter were better understood by the consumer, so that he could comprehend its action in all particulars, we should not hear so many complaints as to incorrect registrations, and its reliability would be more widely appreciated. As it now is, a large majority of consumers know nothing of the construction of the meter. Its mode of operation is a complete mystery to them; and many of them could as readily translate a passage in Sanscrit as to intelligibly read the index dials, and ascertain the amount of gas registered. Is it any wonder that fault is found with bills under these circumstances? In many instances, if the principle of the meter were understood, the futility of such complaints would be seen and an appeal to the common sense of the *soi disant* injured party would have the effect of calming all their suspicions, and of placing the matter in its true light. We have heard of some engineers who were opposed to giving too much publicity to the construction of meters, fearing that frauds might be perpetrated upon the companies, by unprincipled consumers, who would so place the meter as to cause the gas to pass through it unregistered. Although undoubtedly gas is often stolen in this manner, yet the trick is too dangerous to be long played with impunity.

We are satisfied if consumers generally were somewhat informed of the various processes connected with the manufacture and distribution of gas, the effect would be beneficial to companies in more than one respect. They would be better able to appreciate the responsibility of the officers of gas companies, the great skill and judgment which is requisite to successfully produce the light, which has ceased to be classed with luxuries, and has taken its rank among the necessities of civilized life.

Gas engineers have it in their power to assist in the work of diffusing information relative to their professional experience, by noting down their observations at various epochs. Being practical men, and generally possessing a large amount of scientific and theoretical information, they have opportunities for noting the various operations going on in the gas works, and which but for making them public would remain undiscovered. The columns of this Journal are at all times open to the profession, who are cordially invited to assist in the good work of diffusing knowledge in all the details of their operations, and we are sure that information thus published will have the double tendency of throwing light upon one of the most useful branches of technological science, and of promoting harmony and a unity of interests between the companies and their consumers.

PURITY OF WATER—FILTRATION.

From various modern works upon the civilization of the Egyptians, Chinese, Japanese, and other ancient Oriental nations, we learn that at a very early period filters were used by them. There is no evidence, however, to show either that they were acquainted with the true nature of these matters which should be separated from water intended for the use of man, or that they had studied the subject of filtration in a scientific spirit. To those who feel an interest in the purity of water supply we would throw out a few suggestions.

There are many streams and ponds advantageously situated for the purpose of affording an unlimited supply of water to neighboring towns in this country, but which in their natural state are too much contaminated to furnish water in a wholesome condition, Some of these streams hold large quantities of foreign matter in solution, which, of course, no means of filtration could well remove; but in others, the impurities are merely suspended in the water, and a thorough system of filtration, with capacious subsiding reservoirs, would tend to remove many of the objectionable features of the supply, and would obviate the necessity of selecting sources at a greater distance from the points of consumption, and thus materially lessen the cost of the media for distributing water.

The value of animal charcoal as a filtering agent has long been recognized, and a large demand has been created for it, not only for the purpose of removing impurities from water, but as a means of clarifying other liquids and effecting their purification. Some years ago, Professor Faraday suggested its use to remove any lead which may have been dissolved in the water of a cistern or other reservoir, and has been widely adopted; and lead-lined tanks, whose waters are thus treated, may be used with a feeling of greater security than before, although the propriety of using poisonous metal for the purpose may be still questioned, and its utility in a practical point be doubted.

As the cities and towns in this country increase in growth, and with this increase an enlarged demand for pure and wholesome water is creased, the necessities of the case will lead the engineers of water works to pay a liberal meed of attention to improved means of furnishing the supply, and the importance of many innovationf, whose want is not now so extensively felt, will be readily admitted. Among these we may name the subject of filtration, which with several others, will claim a considerable share of attention.

Another improvement which the good sense of those interested in the subject will be doubtless, ere long, inaugurated, will be an equitable system of charges, by which a consumer will be required to pay for only so much water as he actually uses, and not for the extravagance of others, as is now the case. The water meter is the instrument which will bring about this improvement, and we will continue to urge its claims until they are recognized, being satisfied of the propriety and equity of thus regulating consumers' bills by its indications.

PHENOMENA OF GREAT FIRES.

The following sentences, from the Boston *Journal* (which was burnt out), are put on record, as exemplifying a point of the greatest consequence to be considered in connection with the study of great conflagrations:

"Against all calculation the fire relentlessly

marched with stately and majestic tread nearly directly north, striking down the costliest part of the whole city. No language can give the reader who did not see it, an equal conception of the grandness of a great fire like that of Saturday night and Sunday morning, which the writer witnessed from the roof of *The Journal* building.

* * * * * * * *

"Why the flame should have marched steadily *to the windward* against all common reason, but repeats what great conflagrations have before exhibited as a curiosity of fire. At *The Journal* office when the fire broke out there was no sense of insecurity even after Summer street was a mass of flames. Why should there be? The wind blew steadily in a direction to carry the fire away from us. There was no cause for alarm. Still, with a malignant relentlessness the fire marched towards us against the wind."

It must be remembered that in cases of this kind, the spread of the flames, or mode of their propagation, is quite as often, if not oftener, by *radiation* from intensely heated and highly incandescent surfaces, as by actual contact of the burning gases or products of combustion, or otherwise. In fact, it must be that over this mode of propagation water has little or no influence, as it cannot be brought into contact at all with surfaces highly heated by radient heat, but by reason of conversion into the so-called "spheroidal condition," bounds off again like a solid body. Now, it is clear that the side of the fire, or of a burning building, which is fanned by the wind, and which is not obscured by smoke, is that which must radiate most intensely. Moreover, this is the side most difficult for the firemen to approach. In the case of Boston, these conditions were doubtless intensified by the frequent narrowness of the streets, and the irregularity of their system.

THE MANUFACTURER AND BUILDER.

We heartily appreciate and wish to reciprocate the "good words" applied to us by this Journal, now conducted entirely, and with the most signal ability and success, by Dr. Van der Weyde. The following is taken from his October issue, one of the most excellent, by the way, that has appeared, which is saying a good deal. The illustrations given in the *Maufacturer and Builder*, we must especially pronounce to be far in advance of any other of our exchanges.

"THE AMERICAN GAS LIGHT JOURNAL AND CHEMICAL REPERTORY, edited by Professor Henry Wurtz. This journal, interesting for all who like to keep posted in regard to the progress in many branches of practical chemistry, is at present most ably conducted, and one of our most welcome evchanges. One distinguishing feature is, that the editor, like a true scientist, gives always, conscientiously, credit where it belongs, and does not scissor in the way of many other editors, who, by not naming the origin of their scissored articles, often have credit accorded to them by other papers to which they have no claim. The *Manufacturer and Builder* especially has abundant reason for complaint in this respect."

FOR SALE.

An Exhauster,

made by R. LAIDLAW & SON, Glasgow, to pass **150,000** cubic feet per hour. Apply to

W. W. GREENOUGH,
Treasurer Boston Gas-Light Co.

311-4t

SITUATION WANTED

By a COMPETENT MACHINIST and GAS ENGINEER, who has had several years experience in erecting Gas Works and Manufacturing Gas. Can furnish reference in regard to capability, etc. Address, GAS ENGINEER, Station F., New York Post Office. 311

WANTED—By a man of many years experience in the Working and Management of a small Gas Works. Thoroughly understands all its branches. Is fully conversant with Building and Repairing, laying Pipes, etc. Can furnish the best of references. Address, Y. Z., Post Office, Hamilton, Ontario. 311 1t

To Gas Companies.

AN AMERICAN ENGINEER,

who has for many years made Gas a speciality, during which time he has built and managed a number of Works, and is now running one designed and built by himself, desires to change, for reasons which will be given at interview.

Unexceptional refetence furnished as to ability and business qualifications.

☞ Would run a Works by contract or lease.

Address, GAS ENGINEER, Post Office box 341, New York City. 310-2m

FOR SALE,

50,000 TONS OF GAS CANNEL.

E. FOSTER & CO.,

COAL CANNEL AND IRON MERCHANTS,
21 John Street, Adelphi,
LONDON.

E. FOSTER & Co. have for sale Fifty thousand tons of Gas Cannel for delivery over next year. Analysis, 10,000 cubic feet of gas per ton. Illuminating power 23 candles. Coke 12 cwt.

Coals of all descriptions shipped from any port.

Stacks and Benches Built,

AND

CLAY AND IRON RETORTS SET,

FOR GAS WOKKS, BY

HENRY L. THOMAS,
310-3m 2148 North Second Street, Phil'a.

Prof. Henry Wurtz,

Scientific and Practical Chemist and Geologist.

26 PINE STREET, ROOM 36, NEW YORK.

(Office Hours 1 to 4 daily, except Saturdays.)

Geological Explorations and Reports—Chemical Analyses—Advice and Investigations in all the Chemical Arts—Chemical Inventions and Improvements made.

[Prof. W. makes a specialty of GAS CHEMISTRY, and the Analysis of Gas and Coals. Formerly Chemical Examiner in the U. S. Patent Office Practices as

Patent Agent, Counsel and Adviser

of INVENTORS, in all the CHEMICAL ARTS; for which his great general experience in these Arts, and his special experience inside the Patent Office, have qualified him to an unparalled degree.

Prof. WURTZ is Editor of the AMERICAN GAS-LIGHT JOURNAL AND CHEMICAL REPERTORY, a journal whose circulation and patronage is among classes of the community of the highest position, influence and enterprise; and which furnishes therefore an unequalled medium for communication to the general public, of valuable inventions and novel enterprises.

For procuring British and other Foreign Patents promptly, and on moderate terms, Prof. W.'s arrangements are unusually complete and perfect. Inventors may assure themselves of the most *competent, diligent* and *faithful* attention to the interests.

GEO. A. McILHENNY'S

PATENT

VACUUM PROCESS,

FOR RELIEVING GAS RETORTS FROM PRESSURE.

Patented in the United States and Great Britain, June 1867 first patent for this purpose in the United States (but not presented to the public until fully tested). Now in successfu operation for six years, with most satisfactory results.

The many devices lately brought to the notice of the American public, to accomplish the same results are mostly old English contrivances tried and abandoned years ago, on account of the machinery, stuffing boxes, valves, levers, etc., necessary

But the extraordinary results obtained by the McIlhenny process, have induced some unprincipled persons to bring to the notice of the public, as *recent inventions of their own*, some of these old devices; their purpose seems to be simply to evade the patent.

This process is not only safe, simple and effective, but costs little to apply. The only machinery necessary is a one and a half inch stop cock, and a half inch stop cock to each bench No alteration in the old system is required. In fact, a Works operated with this process, can at any time be operated on the old pressure system, simply by closing the two stop cocks above mentioned. There is nothing to get out of order, nothing that requires special attention; no stuffing-boxes to pack and keep tight, no valves to keep clear of tar an i pitch, no levers to lubricate, and no expense for a great amount of machinery.

The McIlhenny process challenges the world as regards yield and quality of gas.

For particulars apply to GEO. A. McILHENNY, Engineer of the Washington Gas-Light Co., Washington, D. C., or to WILLIAM YORKE, Engineer of the Portland Gas-Light Co., Portland, Me., who will take pleasure in corresponding with any one interested. 307-1y

RETORTS AND PIPES FOR SALE.

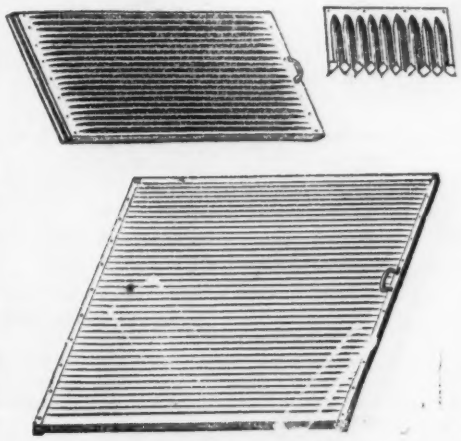
Three new Iron Retorts, never used. Mouth-pieces, Stand Pipes and Bridge Pipes complete (Sixes) for three Benches o Retorts (Three's). Have remodeled the Works and got in new patterns. Will be sold at half the price of new ones

Address W. H. DENNISTON,
307-unl Sup't East End Gas Co., Pittsburgh, Pa.

J. L. Cheesman,

MANUFACTURER OF

Patent Conically and Diamond Slotted Solid Wood Trays.



To Gas Companies.

The above Trays will last longer, and are cheaper than any Tray now used. They are now made without any outside strips, which gives more purifying surface, being perfectly smooth. The lime will not adhere to them as in other Trays. They are now used in over three hundred Gas Companies in the United States, and other places.

JOHN L. CHEESMAN,
151 and 153 Avenue C, New York.

HARTMANN, LAIST & CO.,

MANUFACTURERS OF

GLYCERINE for GAS METERS,

53 West Second Street,

CINCINNATI, OHIO.

☞ We are now prepared to furnish Glycerine to Gas Companies, etc., for filling Meters.

☞ Orders promptly executed. 306-3m

131,929.—Water Meter.—H. M. Bartlett.

132,059.—Turbine Water Wheel.

132,126.—Volute Chutes for Water Wheel.—W. W. Weaver.

132,264.—Treating Ammoniacal Liquor of Gas Works, etc.—H. H. and C. J. Eames.

132,265.—Manufacture of Gas from Hydrocarbons.—H. H. and C. J. Eames.

132,266.—Vaporizing Hydrocarbons for Heating, etc.—H. H. and C. J. Eames.

5,098.—Illuminating Apparatus.—G. Cuppers. (Reissue.)

132,298.—Water Wheel.—A. C. Lesner.

132,496.—Liquid Gas Meter.—D. B. Spooner.

132,383.—Water Wheel.—D. Bowles.

132,406.—Water Meter.—D. B. Spooner.

132,542.—Purifying Illuminating Gas.—A. Ruthel.

PRICES OF FOREIGN AND DOMESTIC GAS COALS.

[Reported Expressly for this Journal.]

DECEMBER 16, 1872

DELIVERED IN NEW YORK.

English Cannel.

Ince Hall	$13 50	@	14 00
Kirkless Hall	13 00	@	13 50

English Caking Coals.

Newcastle Gas	$7 50	@	8 00
Liverpool caking	7 25	@	7 50

British Province Coals.

International—At Mines, $2 00 in currency			— —
Block House—At Mines, $1 50, Gold			6 25
Little Glace Bay—At Mines, 1 60 Gold			— —

Pennsylvania Coals.

Penn Gas Coal—At Amboy	$6 75	@	0 00
Westmoreland	6 75	@	0 10
Shaftón	6 00	@	0 00
Youghiogheny—At Baltimore	5 50	@	0 00

West Virginia Coals.

MurphyRun	$6 75	@	0 00
Despard	6 75	@	0 00
West Fairmont	6 87½	@	7 00
American Gas Coal	6 62½	@	6 75
Fairmont	6 75	@	0 00
Newburgh Orrel	6 75	@	0 00
Pinnickinick	6 75	@	0 00
Cloverhill of Virginia	5 25	@	5 50
McKenzie Compound Mixture			8 00

American Cannel Coals.

Peytona of West Virginia	$14 00	@	14 50
Darlington of Pennsylvania			— —
American Cannel	$10 00	@	10 00

Asphalts.

Albertite of New Brunswick	$18 00	@	18 00
Ritchie Mineral of West Virginia	17 10	@	00 00
Trinidad Bitumen	— —	@	14 05

Advertisers Index.

☞ In looking for advertisements, see figures 1 to 12, within brackets, at head of advertisement pages.

GAS BURNERS, APPARATUS, ETC.

American Meter Co.—West 22nd st., N. Y., Arch and 22d st., Phil., 23 West st., Boston 6
Agency for the Gibson Improvement—W H. Grenelle, 41 Pine street, N. Y. 9
Cast Iron Gas and Water Pipe—Smith & Ellis, York and Meyer streets, Phila., Pa 4
Cast Iron Gas and Water Pipes—R. D. Wood & Co., Philadelphia Pa 3
Cast Iron Gas and Water Pipe—Henry G. Nichols, 14 Platt street, New York 5
Cast Iron Gas and Water Pipe—Jno. McNeal & Sons, 117 Broadway, N. Y. .....
Gas-Burners—C. Gefrorer, 259 Commerce st., Philadelphia, Pa 6
Gas Purification—St. John and Cartwright 6
Gas Meter Manufacturers—Harris & Bro., 1117 Cherry st., Philadelphia, Pa 6
Gasometers, Etc.—Geo. Stacey & Co., Cincinnati, O 3
Gas Fixtures, Etc.—Mitchell, Vance & Co., 597 Broadway .. 4
Gasholders, Etc.—Delly & Fowler, 39 Laurel st., Philadel .. 4
Gas and Water Pipes—B. S. Benson & Son, Allentown, Pa .. 5
Gasometers, &c.—Keystone Iron Works—2132 Filbert st., Philadelphia 4
Gas Screens—American Gas Screen Manufacturing Co., Haverhill, Mass 1
Jersey City Gas Meter Works, 14 Morris st., Jersey, N. J 3
Northwestern Gas and Water Pipe Co.—646 Wabash Ave., Chicago, Ill 7
Patent Conically Slotted Wood Trays—John L. Cheesman, 147 and 149 Avenue C., N. Y. 5
Patent Gas Exhauster—Smith & Sayre, 95 Liberty street .. 9
The Gas Light Co. of America—Box 5230, New York city ... 4

GAS COALS.

Despard Coal Co.—Parmelee & Bros., Agents, 32 Pine st., N. Y. 4
Gas Coals—Bird, Perkins & Job, 86 South st., N. Y. 5
Grahamite or Ritchie Mineral—27 South Charles street, Baltimore, Md. 8
Ohio Gas Cannel—George Merryweather, 5½ Pine street, New York 3
The Newburg Orrel Coal Company—Chas. W. Hays, Agent in New York, Trinidad Building, 111 B'way, Room 7 5

FOUNDRIES.

Atlantic Dock Iron Works—Hoy, Kennedy & Co., Office 98 Liberty street, N. Y., P. O. Box 2343 3
Cast-Iron Pipes and Fittings—B. S. Benson, 52 East Monument street, Baltimore, Md 6
Continental Works—T. F. Rowland, Greenpoint 5
Camden Iron Works, Camden, N. J.—Jesse W. Starr & Sons 7
Gloucester Iron Works—J. P. Michellon, Sec., 6 North 7th street, Phila., Pa 7
Louisville Pipe Works—Dennis Long, cor. 9th and Water sts., Louisville, Ky 7
National Foundry and Pipe Works—Wm. Smith, Carroll, Pike, Smallman & Wilkins streets, Pittsburg, Pa 5
Pascal Iron Works—Morris, Taskar & Co., Philadelphia 19
Providence Steam and Gas Pipe Co., Providence, R. I.—H. A. Branch, Agent 4

WATER METERS, PUMPS, ETC.

Cast Iron Pipes for Water and Gas—Riley A. Brick, 89 White street, N. Y. 6
Valves for Water, Steam and Gas—Ludlow Valve Man'g Co., 193 River street, Troy, N.Y. 5
Water Pipes, etc.—S. Fulton & Co., 412 Walnut st., Phila ... 6

CLAY RETORT WORKS.

B. Kreisher, Clay Retorts, etc., 58 Goerck st., New York 8
Clay Retorts, Fire Brick, Tiles, etc.—Wilson & Gardner, Lockport, Westmoreland Co., Pa 8
Cheltenham Fire Brick and Clay Retort Works—Evens & Howard, 916 Market street, St. Louis, Mo 5
Jersey City Fire Brick Works—J. H. Gautier & Co., Greene Essex and Bergen sts., Morris Canal Basin, N. J 8
Laclede Fire Brick Works, 107 North Levee, St. Louis, Mo .. 8
Manhattan Clay Retort Works, 15th st., near Av. C, N. Y .. 8
Philadelphia Fire Brick Works, Vine and 23d sts., Phila 8
Retorts, Etc.—Geo. C. Hicks & Co., Baltimore Md 6

LAMPS, STOVES, PETROLEUM, ETC.

Patent Lamp Post—J. W. Graham, Chillicothe, Ohio, or A. M. Callender, office of this Journal 9

MISCELLANEOUS.

Architect and General Gas Engineer—William Farmer, 111 Broadway Room 91 3
A Synopsis of British Gas Lighting—Jas. R. Smedberg, San Francisco, Cal 4
American Journal of Science and Arts—Silliman and Dana, New Haven Conn. 7
Contractors for Gas Works, Etc.—Murray & Baker, Fort Wayne, Ind 5
Fodell's System of Bookeeping—A. M. Callender & Co., 42 Pine st., New York 8
Journal of the Franklin Institute—Prof. W. H. Wahl, Franklin Inst., Phila,, Pa 4
On the Advantages of Gas for Cooking and Heating—Magnus Ohren, Lower Sydenham, London, S. E 5
School of Mines, Columbia College, East 49th st 5
Scientific and Chemical Expert—Prof. H. Wurtz, 26 Pine street, room 36, N. Y 7
Screening Shovels—O. R. Butler, 126 Maiden Lane, N. J 4
Works upon Gas—D. Van Nostrand, 23 Murray street and 27 Warren street, N. Y 9

AMERICAN

GAS SCREEN MAN'F'G COMPANY.

TO GAS-LIGHT COMPANIES.

Your attention is respectfully called to the GAS SCREEN now being manufactured by the American Gas Screen Manufacturing Company, under the patents granted to E. DUFFEE, and are pleased to submit the following points of their excellence and superiority over all other screens now in use.

The Screen is made with an oak frame, interlaced with split rattan, drawn through holes at regular intervals in the Frame and cross-pieces, the edges of the frame being grooved to prevent abrasion.

The advantages of the screen are:

1st. The large purifying surface, the construction of the Screen giving over three-fourths of the surface for the gas to penetrate the lime.

2d. On account of the free passage of the gas through the Screen the pressure is reduced, thereby preventing the accumulating of carbon on the retorts.

3d. The saving of lime and labor, as the Screens are not liable to clog, and are easily cleaned.

4te Their cheapness and simplicity of construction.

5th. Their DURABILITY—they can be used longer than any other now used.

Testimonials.

PROVIDENCE, RHODE ISLAND, March 21st, 1872

LUTHER DAY, Esq., Agent, etc.

Dear Sir: The Trays manufactured by you for our West Station were put in use in September last, and have *given perfect satisfaction.*

The frames are well put together, and I see no reason why they will not last for a long time. The *very large amount of open space* in these Trays gives the gas an easy passage, and brings it into contact with the lime much better than when the space is so contracted, as is the case in most of the other Trays in use.

The pressure thrown upon the retorts by contracted passages is very great and were gauges used more frequently than they now are in many gas-works, this facat of having *open Trays* would become more apparent to mangers of gas works. The digerence in pressure at this station in passing the gas through your purifiers, is two-tenths (2-10) inches.

The amount of gas purified, per bushel of lime used to this date, is six thousand five hundred and fifty six (6,556) cubic feet.

Respectfully yours,
JAMES H. ARMINGTON, Supt.

BOSTON GAS-LIGHT CO., Dec. 1871.

Dear Sir: In answer to your inquiry how we like your Patent Tray for dry gas purifiers, I take pleasure in saying we have used them exclusive of all others, for the last three years, and think them far ahead of any yet offered. The surface being nearly three times that of any other Tray, and their lightness and durability perfectly satisfactory.

Yours respedtfully,
A. M. GILES.

EDWARD DUFFEE, Esq.

EAST BOSTON, JUNE 15, 1871.

Gentlemen: We have used your Screens some five years. They give perfect satisfaction.

I consider them *by far the best Screen* for Dry Lime Purifiers I have seen. Yours truly, A. M. NORTON, Supt.

CHELSEA, May 1, 1871.

Mr. E. DUFFEE.

We are using your Purifying Trays, and find them to be the *best of any* that I have used, and will *purify more gas with less pressure* than any tray that I know. I can fully recommend them, after four years trial, to any Gas Superintendent with perfect safety, as the *cheapest and best Tray made.*

Yours truly, JOHN ANDREW, Sup't.

DORCHESTER, March 3, 1870.

Mr. E. DUFFEE.

Dear Sir: We have had your Gas Trays in constant use for almost one year and six months, and find them superior to any others we have ever used, both in point of economy and efficiency. Truly yours, W. B. BROOKS,
Agent Dorchester Gas-Light Co.

JAMAICA PLAINS, MASS., June 21, 1871.

EDWARD DUFFEE, ESQ.

Dear Sir; The Trays ordered by this company three years ago, are getting somewhat worn. I wish to say here that I consider your Trays to be superior to any yet invented, therefore please make us another set at the price named, to be like the sample shown in every way, and oblige Yours truly
JAMES F. ROGERS,
Sup't Jamaica Plains Gas-Light Co.

BROOKLINE, June 11, 1871.

E. DUFFEE, ESQ.

Dear Sir: You will please make a set of Gas Trays for this company as soon as convenient, at price named. In regard to the merits of the Tray, after having them in constant use for over two years, I will say that I consider them *superior to any Tray* manufactured in this country. Respectfully yours,
H. A. ALLYN,
Sup't Brookline Gas-Light Co.

BANGOR, August 2, 1870.

EDWARD DUFFEE, ESQ.

Dear Sir: Yours of the 20th ult. is received. In regard to your Gas Trays, I take pleasure in saying that they have been in use over two years, and have given perfect satisfaction and they are in good order at the present time; should have no hesitation in recommending them, beheving they are the most durable and easiest kept in order of any with which I am acquainted. Respectfully yours,
W. H. PERRY, Sup't.

OFFICE OF THE SPRINGFIELD GAS-LIGHT CO.
SPRINGFIELD, MASS., Oct. 10, 1871.

Mr. WARD,
President Hartford Gas-Light Co.

Dear Sir: I have been using Gas Screens made by the American Gas Screen Company, for nearly a year, and find them superior in every way to the wooden Screens made and formerly used by the Springfield Gas-Light Co. I can purify more gas with the same quantity of lime, there being more surface to the Screens; and I consider them more durable, and recommend them to your consideration.

Yours with great respect,
GEORGE DWIGHT.

ROXBURY, June 14, 1872.

EDW. DUFFEE, ESQ.

Dear Sir: In answer to your inquiry regarding your Patent Gas Screens, I am happy to be able to say, that after nearly three years constant use we are perfectly satisfied with them being able to purify over fifty per cent. more gas with them, than with any other Screen we have used.

Yours respectfully,
THOMAS J. PIERCE.

OFFICE DETROIT GAS-LIGHT CO.,
DETROIT, MICH., April 22, 1872.

AMERICAN GAS SCREEN MANUFACTURING CO., HAVERHILL.

Gentlemen: The Screens bought of you work far better than any we have ever used. As a proof, we have with the same quantity of lime purified *twenty per cent.* more gas with your Screens than with any others, and the work well done. The workmen are also better pleased with them—they being light and handy to work. They also relieve the pressure very much upon the retorts, and I cheerfully give yan my experience.

Yours truly,
P. E. DEMILL, Secretary.

We give a list of some Gas-Light Companies using them.

Providence, R. I. Gas-Light Co.. Boston, Mass. Gas-Light Co.: East Boston, Mass., Gas-Light Co.; South Boston, Mass., Gas-Light Co.; Springfield, Mass., Gas-Light Co.; New Bedford, Mass., Gas-Light Co.; Manchester, N. H., Gas-Light Co.; Reading, Penn., Gas-Light Co.; Biddeford, Me., Gas-Light Co.; Hartford, Conn., Gas-Light Co.: New Haven, Conn., Gas-Light Co.; New Orleans, La., Gas-Light Co.; Savannah, Ga., Gas-Light Co.; Charleston, S. C., Gas-Light Co.; Trenton, N. J., Gas-Light Co.; Charlestown, Mass., Gas-Light Co.; Dorchester, Mass., Gas-Light Co.; Chelsea, Mass., Gas-Light Co.; Baltimore, Md., Gas-Light Co.; Manhattan, N. Y., Gas-Light Co.; Cincinnati, Ohio.; Gas-Light Co.: San Francisco, Cal., Gas-Light Co.: Albany, N. Y., Gas-Light Co.; Sacramento, Cal.; St. Joseph, Mo., Gas-Light Co.; Leavenworth, Kansas, Gas-Light Co.; Macon, Ga., Gas-Light Co.; Roxbury, Mass., Gas-Light Co.; Lansinghburg, N. Y., Gas-Light Co.; Bridgeport, Conn., Gas-Light Co.; Stamford, Conn., Gas-Light Co.; Poughkeepsie, N. Y., Gas-Light Co; Scranton, Penn., Gas-Light Co.; Lewiston, Me., Gas-Light Co., and one hundred others.

Address A. P. JAQUES, Treas.,
Amer. Gas Screen Man'f'g Co., Haverhill, Mass

WILLIAM FARMER,

ARCHITECT AND GENERAL GAS ENGINEER,

111 BROADWAY, TRINITY BUILDING, Room 95, New York.

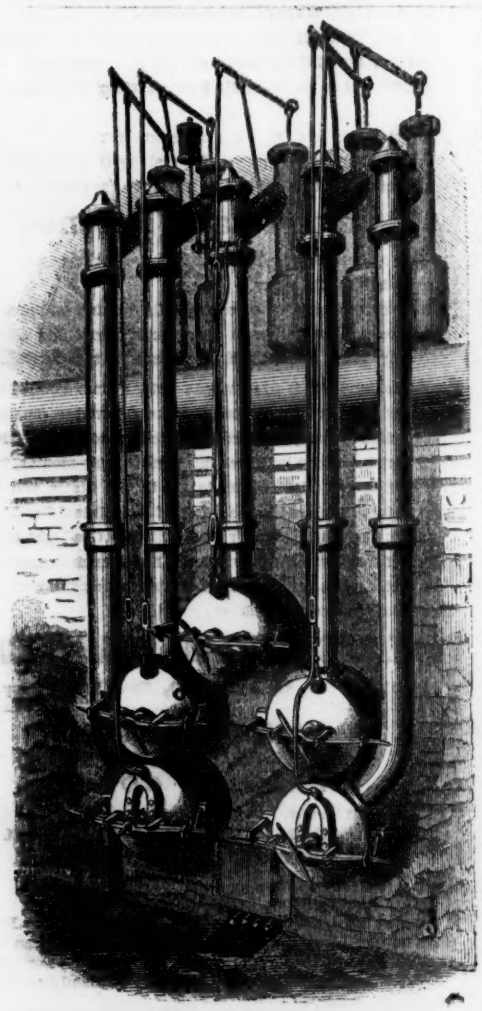
WILLIAM FARMER may be consulted upon all matters connected with the construction of GAS WORKS and other buildings. Will furnish General and Detail Drawings, Specifications and Estimates for Gas Works of any capacity, Retort Settings, Condensers, Washers, Exhausters, Purifiers, Holders, Coal Hoisting Apparatus, Iron Roofs, and every description of Machinery required in the Manufacturing of Gas.

PATENTEE OF THE FOLLOWING INVENTIONS:

Exhausters for Gas and Foul Lime Ventilation,
Dumping Barrows for Coal, Coke and Lime,
Blowers for Forgers,
Pumps for Water, &c., &c.

REFERENCES:

CHAS. ROOME, President Manhattan Gas-Light Company, N. Y.
SAMUEL DOWN, President American Meter Company, N. Y.
C. VANDERVOORT SMITH, Engineer Manhattan Gas-Light Company, N. Y.
CHARLES MOWTON, Engineer New York Gas-Light Company, N. Y.
SAMUEL P. PARHAM, Engineer Mutual Gas-Light Company, N. Y.
Prof. HENRY WURTZ, Editor AMERICAN GAS-LIGHT JOURNAL.
HENRY J. DAVISON, Engineer, 77 Liberty Street, N. Y.
HERRING & FLOYD, Oregon Iron Foundry, 738 Greenwich Street, N. Y.
FREDERICK SABBATON, Engineer Troy Gas-Light Company, Troy, N. Y.
Col. WHITE, Engineer People's Gas-Light Company, Williamsburgh, N. Y.
GEORGE W. PARSONS, Sup't and Eng'r, Rochester Gas-Light Co., Rochester, N. Y.
GEORGE W. EDGE, Engineer, Jersey City Gas-Light Co., Jersey City, N. J.
J. H. GAUTIER & Co., Fire Brick Works, Jersey City, N. J.
Professor SILLIMAN, New Haven, Conn.
JOHN HARRISON, Engineer People's Gas-Light Company, Baltimore, Md.
CHARLES FABEN, Superintendent and Engineer Toledo Gas-Light Co., Toledo, O.
PETER F. BURTIS, Supt. and Engineer, Chicago Gas-Light Co., Chicago, Ill.
JAMES R. SMEDBERG, Consulting Engineer, San Francisco Gas-Light Co., Cal. [254-



A. F. HAVENS'S
ADJUSTABLE AUTOMATIC DIP-SEAL,
AND
Improved Retort Lids.

The Seal closes automatically, when the retort-lid is removed, and is broken by replacing the lid. No mistake can possibly be made. The rods are adjustable in a moment to any contingency. The new attachments are adaptable to any Works. Cost only that of rough castings. No lute used, and no leakage at lids. Half the number of lids only needed. Capacity of mains greatly increased. In new Works no mains. No carbon in retorts, seldom in stand-pipes. Address

CHARLES HUBBARD, JR.,
60 Vesey Street, N. Y.

2[0tan]

OHIO GAS CANNEL,
From the Sterling Colliery.

I am now prepared to place in the market, through my agencies as below, a regular and unlimited supply of this valuable Cannel, for gas purposes. A recent analysis, by Prof. WURTZ, Editor of this Journal, at the Laboratories of the NEW YORK GAS-LIGHT COMPANY, gave 47½ per cent of Volatile Matter and 45 bushels to the ton of a fair quality of coke. The yield of gas was at the rate of 9,500 feet per ton of about 27 candle power. It is not highly sulphurous, can be purified by Lime, and the ash from the coke does not clinker.

GEORGE R. TUTTLE, Proprietor,
Cleveland, Ohio.

GENERAL AGENCIES.

George Merryweather, 5½ Pine Street, N. Y.

252

ATLANTIC DOCK
Iron & Machine Works,
FERRIS, WOLCOTT AND DYKEMAN STREETS,
South Brooklyn.

HOY, KENNEDY & CO., AGENTS.

Office 98 Liberty Street. P. O. Box 2,348

HOY, KENNEDY & CO.,
ENGINEERS AND CONTRACTORS

For the Erection or Extension of Gas Works.

PLANS, SPECIFICATIONS AND ESTIMATES.

MANUFACTURERS of every kind of Gas Machinery, Retorts Bench Castings, Wrought Iron Work, Multitubular and Air Condensers, Washers, Scrubbers, Purifiers, Exhausters with every equipment complete for large or small Works, Gasholders, Telescopic or Single; Iron Roof Frames with Cornice Gutters, covered with Corrugated Iron or Slate; Iron Doors and Iron Pivot Blind Windows; Coke Barrows, Fire Tools, Retort Lids, Cotter Bars and Screws, Stop Valves, Tar Valves for Regulating Dip in Hydraulic Mains, Pressure Governors for Street Mains, and Compensators for Exhausters that are unrivalled for unvarying accuracy Steam Engines, Boilers, Etc., Etc.

Agents for G. W. EDGE'S PROCESS for removing Carbon from Retorts.

Post Office Box 2,348. Office 98 Liberty st

CAUTION.

SEVERAL CONTRIVANCES HAVING BEEN DEVISED for the purpose of dispensing with the dip-pipe seal, by means of a valve, or cut-off, between the retort and the hydraulic main, in gas works, since this method of making gas was introduced by the AMERICAN COAL GAS LIGHT IMPROVEMENT COMPANY, all of which are infringements upon Letters Patent, numbered 95,459—116,450—and 119,135, owned by said Company. All Gas-Light Companies are cautioned against the use, without license or authority from the undersigned., of said devices.

The Am. Coal Gas Light Improvement Co.
JOHN H. BLAKE, President.

5 PEMBERTON SQUARE, BOSTON. 41 PINE STREET, N. Y.

JOHN McNEAL & SONS,
MANUFACTURERS OF
Cast Iron Gas and Water Pipe.

Works—Burlington, N. J.
Office—117 Broadway, N. Y.

Having withdrawn from the firm of R. D. WOOD & Co., the practical management of which we have had since the organization of that firm until June 1871, we have now completed our Works for the manufacture of CAST IRON PIPE and Castings generally.

Having immediate rail and water communication with New York and Philadelphia, as well as the coal and iron regions we have every advantage of situation.

Our experience in the manufacture of Pipe for a great many years, has enabled us in rebuilding to practically apply Machinery and Fixtures of the very best character, to insure *good work*.

We are now prepared to contract for this class of Castings under the most favorable terms.

We have associated with us Mr. H. G. H. TARR, formerly with R. D. WOOD & Co., who will take charge of our sales department in New York. 262-1y

GEO. STACEY. HENRY CRANSHAW. WM. STACEY.

GEO. STACEY & CO.,
MANUFACTURERS OF SINGLE AND TELESCOPIC
GAS-HOLDERS.
AND ALL KINDS OF
Cast and Wrought Iron Work
Used in the Erection of Gas and Coal Oil Works.

Foundry on MILL STREET; Nos. 33, 35, 37 and 39.
Office and Wrought Iron Works on RAMSAY STREET, Cincinnati, Ohio.

REFERENCE.

Cincinnati Gas-Light Co.	Baton Rouge, La., Gas Co.
Indianopolis Gas Co.	Saginaw, Mich., Gas Co.
Dayton, O., Gaslight Co.	Oshkosh, Wis., Gas Co.
Covington, Ky., Gas Co.	Peoria, Ill., Gas Co.
Springfield, O., Gas Co.	Quincy, Ill., Gas Co.
Terre Haute, Ind., Gas Co.	Champaign, Ills., Gas Co.
Madison, Ind., Gas Co.	Carlinville, Ill., Gas Co.
Kansas City, Mo., Gas Co.	Bowling Green, Ky., Gas Co
Topeka, Kansas, Gas Co.	Hamilton, Ohio, Gas Co.
Burlington, Iowa, Gas Co.	Vicksburg, Miss., Gas Co.
Nashville, Tenn., Gas Co.	Denver City, Cal., Gas Co.

R. T. Coverdale, Eng'r Cincinnati, and others.

SPECIAL NOTICE.

PARTIES WRITING TO THE UNDERSIGNED ON GAS Matters, will please address J. B. CHICHESTER,
Engineer, Bayonne and Greenville Gas-Light Co.
803-6m Bergen Point N. J.

KEYSTONE IRON WORKS,

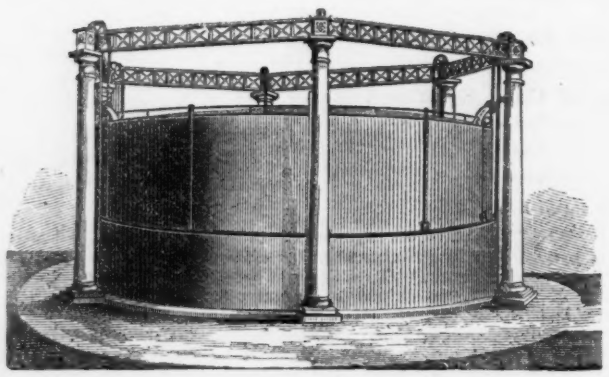
2132 FILBERT STREET, Philadelphia,

G. W. KRAFT, Proprietor,

MANUFACTURES

GASOMETERS.

COAL CARS, PURIFYING BOXES, COKE BARROWS.



WATER TANKS. RETORT HOUSE ROOFS.

Wrought Iron Work for Bridges, Buildings, Steam Boilers, Tanks, Stills, &c.

Particular Attention paid to Alterations and Repairs.

PROVIDENCE

Steam & Gas Pipe Co.,

PROVIDENCE, R. I.,

BUILDERS OF

Coal and Rosin Gas Works,

FOR TOWNS AND MANUFACTORIES.

Estimates furnished of the cost of Works, and cost to Manufacture Gas in any Locality.

Gasholders,

Iron Truss Retort House Roofs,

Water Tanks,

Purifier Covers,

Coke Barrows,

Cast Iron Socket Pipe.

Particular attention given to Enlarging and Re-building Gas Works.

For Lighting Manufactories, our Rosin Gas Works have been successfully used for *many years* past. They require but small outlay, and afford a *safe* and *economical* light.

FOR SALE AT MANUFACTURERS PRICES:

EXHAUSTERS AND COMPENSATORS,
IRON AND CLAY RETORTS,
FIRE BRICK, CLAY AND TILE,
ROMAN CEMENT AND ROSIN,
STATION AND CONSUMERS' METERS.

REFER TO

Manufacturers' Gas Co., Fall River, Mass.; Youngstown Ohio, Gas Co.; New Rochelle, N. Y., Gas Co.; Homer and Cortland, N. Y. Gas Co.; Danbury, Conn., Gas Co.; North Bridgewater, Mass., Gas Co.; Cold Spring, N. Y., Gas Co., Rockville, Conn., Gas Co.; Taunton, Mass., Gas Co.; Pawtucket, R. I., Gas Co.

Frederick Grinnell, President, J. C. Hartshorn, Treas, S. Millett Thompson, Secretary.

Office and Manufactory, corner of Pine and Eddy Streets, Providence, Rhode Island.

Office in Syracuse, N. Y., No. 1 Granger Block.

H. A. BRANCH, Agent.

MITCHELL, VANCE & CO.,

Manufacturers of

CHANDELIERS!

And Every Description of

GAS FIXTURES,

Also Manufacturers of

F Gilt, Bronze and Marble Clocks, warranted best Timekeepers, Mantle Ornaments, &c.

Salesroom, 597 BROADWAY,

Rear Entrance 140 Mercer Street,)

NEW YORK.

Special designs furnished for Gas Fixtures for Churches Public Halls, Lodges, &c.

Smith & Ellis,

IRON FOUNDRY & PIPE WORKS,

Philadelphia.

SEVERAL THOUSAND 3, 4, AND 6 INCH CAST IRON GAS PIPES OH HAND, FOR IMMEDIATE DELIVERY.

☞ GAS WORKS CASTINGS OF ALL KINDS.

221-6m

P. P. DEILY, J. FOWLER.

DEILY & FOWLER,

39 LAUREL STREET, PHILADELPHIA, PENN.,

BUILDERS OF

GAS WORKS.

MANUFACTURERS OF

GAS-HOLDERS,

WROUGHT IRON ROOFS,
CHARGING-SCOOPS, COAL WAGONS,
COKE BARROWS, AND ALL WROUGHT
WORK CONNECTED WITH GAS-WORKS.

Particular attention paid to the Extension of Works and Repairs to Gasholders, Purifiers, Etc.; also, Builders of Water Tanks, Oil Stills, Etc.

REFER TO

M. H. Jones, Easton Gas Co., Penn.
Franklin Woolman, Burlington Gas Co., N. J.
O. W. Goodwin, Camden Gas Co., N. J.
Benjamin Acton, Salem Gas Co., N. J.
D. H. Smith, Watkins Gas Co., Watkins, N. Y.
W. F. Warner, Oswego Gas Co., N. Y.
E. Wilcox, Joliet Gas Co., Ill.
Messrs. Woodbury, Walter & Potter, Kalamazoo Gas Co., Michigan.
H. H. Fish, Utica Gas Co., N. Y.
W. J. Ball, Terre Haute, Indiana.

(*TO BE PUBLISHED SHORTLY.*)

"A SYNOPSIS OF BRITISH GAS-LIGHTING."

900 *pages, large 4to, profusely illustrated.*

This is the only compend of Gas-Lighting ever projected, and will be the standard work of reference among Companies, Manufactures, Engineers, Patentees, and Scientific Men generally.

Price $15, payable on delivery.

It will be sold only by subscription, which should be addressed to the compiler, JAMES R. SMEDBERG, Consulting Engineer S. F. Gas Co., San Francisco, Cal., or Editors American Gas-Light Journal, No. 42 Pine street, N. Y.

SABBATON'S PATENT Coke and Coal SCREENING SHOVELS.

MADE FROM BEST MALLEABLE IRON.

FURNISHED WITH LONG OR D HANDLES

Perfect in their operation. Very strong, and from their great durability vastly more economical than any substitute. Refer to all the principal Gas Companies in the country, who acknowledge them as the "ne plus ultra" of Coke Screening Shovels.

Orders addressed only to

O. R. BUTLER,
Sole Agent.
No. 96 Maiden Lane, N. Y.

OFFICE OF

THE GAS-LIGHT CO. OF AMERICA

C. K. GARRISON, President.
E. W. McGINNIS, Secretary and Treasurer.
JOHN P. KENNEDY, Chief Engineer.
LEONARD D. GALE, Consulting Chemist.

Gentlemen: We beg leave to inform you, that we have purchased the Patent process for making ILLUMINATING GAS from PETROLEUM and its products, known as the

Gale and Rand Patents,

and we are now prepared to treat with you for the use of said process by your Company.

We are also prepared to contract for putting said process into successful operation in your works, furnishing all the necessary plans, materials, and workmen for that purpose.

We do not deem it necessary to enter upon a detailed description, here, of the processes above referred to, deeming it sufficient to state, to secure your interest and investigation, that they have been in successful operation, for months, in a number of Gas-Light Works in the United States, and are now being introduced in the works of the Mutual Gas-Light Company, of New York City; the Citizens' Gas-Light Company, of Brooklyn; the New Orleans, San Francisco, and very many other Gas-Light Companies throughout the country.

For full particulars, address

THE GAS-LIGHT CO. OF AMERICA.

248-tf] **P. O. Box 5220, New York City.**

THE DESPARD COAL COMPANY

OFFER THEIR SUPERIOR

DESPARD COAL

To Gas Light Companies throughout the country.

Agents, PARMELEE BROTHERS, No. 32 Pine street, N. Y

BANGS & HORTON, No. 31 Duane street, Boston.
Mines in Harrison County, West Virginia.
Wharves Locust Point, } Baltimore.
Company's Office, 29 South street, }

Among the consumers of Despard Coal, we name: Manhattan Gas Light Company, New York; Metropolitan Gas Light Company, New York; Jersey City Gas Light Company, N. J.; Washington Gas Light Company; Portland Gas Light Company, Maine.

*** Reference to them is requested 204-1y

JOURNAL OF THE FRANKLIN INSTITUTE.

Editor—Prof. W. H. Wahl, Ph.D.

ASSISTED BY THE COMMITTEE ON PUBLICATIONS.

This Journal, devoted to Mechanical and Physical Science Civil Engineering, and the Arts and Manufactures, published in monthly numbers of seventy-two pages each, forming two volumes per annum, illustrated with engravings and woodcuts.

The Journal is now in its forty-fifth year of publication, and has become a standard work of reference.

Terms of Subscription.—Five dollars per annum; payable on the issue of the sixth number. When the full subscription five dollars) is paid in advance, the numbers will be sent *free of postage*

Communications and letters on business must be directed to the Actuary of the Franklin Institute, Philadelphia

CHELTENHAM

Fire Brick and Clay Retort Works.

EVENS & HOWARD,

PROPRIETORS,

MANUFACTURERS OF

FIRE BRICK,
CLAY RETORTS,
GAS HOUSE TILE,
BLAST FURNACE TILE,
CHIMNEY TOPS,

SEWERAGE PIPE from 3 to 30 inch diameter,

SUPERIOR DRY MILLED FIRE CLAY, ETC

OFFICE, 916 MARKET STREET.

241-1y **St. Louis, Mo.**

Bird, Perkins & Job,

IMPORTERS OF

Pictou,
Sydney,
Lingan, and
Caledonia,

C O A L,

AGENT FOR

The Westmoreland Coal Company.

Orders received for the delivery of

Red Bank Cannel

from the Red Bank Colliery, Penn., for shipment after 1st. December.

103 STATE ST., Boston. 27 SOUTH ST., N. Y. [24

NATIONAL FOUNDRY

AND PIPE WORKS.

OFFICE AND WORKS—CARROLL, PIKE, SMALLMAN AND WILKINS STREETS,

PITTSBURGH, PA

WM. SMITH,

Manufacturer of all kinds of GAS and WATER PIPE BRANCHES, CONNECTIONS, T's, ELBOWS, and all CASTINGS USED AT GAS AND WATER WORKS,

We offer special inducements to parties wishing to purchase. My Pipe is Smooth, regular in weights, and cast vertically.

N. B.—Pipe from 3-inch and upwards, cast in 12-ft. lengths.

☞SEND FOR CIRCULAR AND PRICE LIST.☜

TYRCONNELL GAS COAL.,

MINED IN TAYLOR COUNTY, WEST VA.

Company's Office, 52 S. Gay St., Baltimore.

CHARLES MACKALL, Secretary.

CHARLES W. HAYS, Agent, Room 7, 111 B'way, N. Y.

SHIPPING POINT—Baltimore, Md.

This coal yields 10,000 cubic feet of Gas, with an illuminating power of over 16 candles. Forty bushels of very superior Coke, with little Ash, and scarcely any clinker. 304-1y

CHARLES HUBBARD, JR.,

Consulting Engineer.

Steel and Iron Forgings, Light and Heavy Steel Castings to any pattern. Would call attention to his new article for Blacksmith's Forges, Jones's Patent Tuyere Iron, which is in successful operation in the leading establishments; can be used in any Forge now at work, or in combination with Jones's Improved Cast Iron Forge, plain or galvanized. Is prepared to furnish estimates of all kinds of Iron work used in the construction and carrying on of Gas Works, including supplies. Sole agents for A. L. Havens's Adjustable Automatic Dip Seal and Improved Retort Lids. Will give personal attention to the prompt execution of all orders. Address 60 Vesey Street, New York. 301

JAMES A. WHITNEY, late Editor of the *American Artisan*, and for four years past President of the New York Society of Practical Engineering, has opened an office as

Patent Agent, Expert in Patent Cases, and Mechanical Engineer,

AT NO. 128 BROADWAY, ROOM 11, NEW YORK CITY,

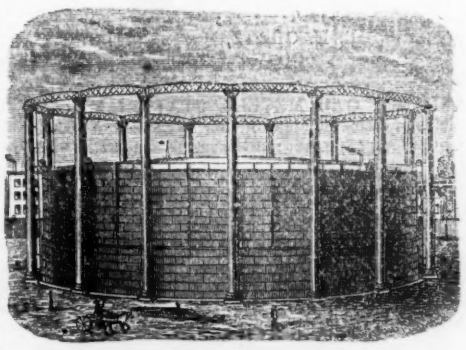
Mr. Whitney has had a practical experience of more than twelve years spent in pursuits directly connected with industrial operations and Patent Agency business, which will enable him to care for the interests of his patrons in the most satisfactory manner. 298

T. F. ROWLAND,

Continental Works,

GREENPOINT, BROOKLYN, N. Y.

ENGINEER, AND MANUFACTURERS OF



GAS-HOLDERS

OF ANY MAGNITUDE,

Condensers, Scrubbers, Purifiers, Retorts, Hydraulic Mains, and all other articles connected with the Manufacture and Distribution of Gas, furnished with despatch. Plans and Specifications prepared, and Proposals given for the necessary Plans for Lighting Cities, Towns, Mansions, and Manufactories.

B. S. BENSON & SON,

No. 112 BROADWAY, N. Y., ROOM 1.

MANUFACTURERS OF

CAST IRON GAS & WATER PIPE,

And Fittings for Gas & Water Mains, &c.

All sizes from 3 to 30 inches, cast vertically, in lengths of 12½ feet.

SCHOOL OF MINES,

COLUMBIA COLLEGE,

EAST 49th STREET, NEW YORK.

FACULTY:

F. A. P. BARNARD, S.T.D., LL.D., President.
T. EGLESTON, Jr., E.M., Mineralogy and Metallurgy.
FRANCIS L. VINTON, E.M., Mining Engineer.
C. F. CHANDLER, Ph. D., Analytical and Applied Chemistry.
JOHN TORREY, M.D., LL.D., Botany.
CHARLES A. JOY, Ph.D., General Chemistry.
WILLIAM G. PECK, LL.D., Mechanics.
JOHN H. VAN AMRINGE, A.M., Mathematics.
OGDEN N. ROOD, A.M., Physics.
JOHN S. NEWBERRY, M.D., Geology and Palaeontology.

The plan of this School embraces a three years' course for the degree of Engineer of Mines, or Bachelor of Philosophy.

For admission, candidates for a degree must pass an examination in arithmetic, algebra, geometry and plain trigonometry. Persons not candidates for degrees are admitted without examination, and may pursue any or all of the subjects taught. For further information and for catalogue, apply to

252-1y DR. C. F. CHANDLER, Dean of the Faculty.

THE NEWBURGH

Orrel Coal Company,

Mines at Newburg, Preston County, W. Va.

Company's Office, No. 52 S. Gay Street, Baltimore, Md.

C. OLIVER O'DONNELL, Pres't. CHAS. MACKALL, Sec'y.

CHAS. W. HAYS, Agent in New York, Room 7, Trinity Building, 111 Broadway.

SINCLAIR & AGNEW, Agents, Alexandria, Va.

This Company offer their very superior Gas Coal at lowest market prices.

It yields 10,996 cubic feet of gas to the ton of 2,240 lbs. of good illuminating power, and of remarkable purity; one bushel of lime purifying 6,792 cubic feet, with a large amount of coke of good quality.

It has been for many years very extensively used by various Gas Companies in the United States, and we beg to refer to the Manhattan, Metropolitan, and New York Gas Light Companies of New York; the Brooklyn and Citizen's Gas Light Companies of Brooklyn, N. Y.; the Baltimore Gas Light Company of Baltimore, Md., and and Providence Gas Light Company, Providence, R. I.

The best dry coals shipped, and the promptest attention given to orders. 234-1y.

PLYMOUTH IRON WORKS.

MANUFACTURERS OF

Cast Iron Gas and Water Pipe,

FROM TWO INCHES TO SIX FEET DIAMETER.

HENRY G. NICHOLS,

SELLING AGENT.

14 PLATT STREET, N. Y. 291-6m

LUDLOW

Valve Manufacturing Co.

OFFICE 193 RIVER STREET, TROY, N. Y.

Make Valves—Double and Single Gate—¾ inch to 36 inch, for Water, Gas and Steam.

"CINCINNATI, March, 1870.

"I would say that if any certificate or affidavit is desired in relation to the superior character of the Ludlow Valve above others that I have seen, the same will be cheerfully given. I think, however, that the Valve proves for itself.

"JOSEPH MAYER,
"Superintendent Water Works

"DAYTON, OHIO, June 27, 1870.

"I have to say that we find them always in order—operating easily unde all degrees of pressure. In a words they have given perfect satisfaction in every particular.

"GEORGE LEHMAN,
"Chairman Water Works Committee.

"CANTON, OHIO, June 27, 1870.

"We are now using and have been, since the commencement of our works, your valves, and they are proving entirely satisfactory.

"JOHN S. SHORB,
"Superintendent Water Works."

"PEORIA WATER WORKS, July 1870.

"With pleasure I can testify to their superiority. The action has been perfect under all degrees of pressure, a have given perfect satisfaction.

"S. A. KINSEY, Ex. Sup't.
"JOHN J. STEIGER, Sup't

"BROOKLYN GAS LIGHT COMPANY

"I take great pleasure in saying tha they give perfect tisfaction—opening easily and quickly, and requiring no eff to start them; even after they have been closed for month

"A. F. HAVENS, Engineer."

"OFFICE OF PHILADELPHIA GAS WORKS, 14th June, 1870.

"I am pleased to state that the lot of large Gas Valves bought from you (Hart & Buck), as agents of the Ludlow Manufacturing Co., have given me perfect satisfaction. The double gate water valve, bought for a special purpose, also works admirably. We want no better valves. The Indicator on your valves is a great improvement over the old style.

"THOS. R. BROWN, Engineer."

MURRAY & BAKER,

Practical Builders.

And Contractors for the Erection of Gas Works,

MANUFACTURERS OF ALL THE LATEST AND MOST IMPROVED APPARATUS AND TOOLS FOR THE MANUFACTURE & DISTRIBUTION OF COAL GAS.

☞ WORKS AT THE RAILWAY DEPOTS,

FORT WAYNE, INDIANA.

We manufacture Bench Castings, Washers, "The Immersed Multitubular," and Atmospheric Condensers, Wet and Dry-Lime Purifiers, Dry Center Seals, Telescopic and Single Gas Holders, Wrought Iron Trussed Roof for Iron or Slate, Wood and Iron Trays for Purifiers, Coke and Coal Carts, Wrought Iron Screening Shovels and Castings, and Wrought Work of every description for Gas-Works.

As Mr. Murray is a Practical Draughtsman, we will furnish plans and specifications to parties or associations, or will wait personally upon parties contemplating the construction of new works, or the alteration or extension of old ones.

The most satisfactory references can be given, if required, of the experience and commercial fairness which characterizes our dealings.

We would respectfully invite Western men to call and see our patterns and works here. MURRAY & BAKER,

198-1y Fort Wayne, Indiana.

THE AMERICAN METER COMPANY.

Organized under the General Manufacturing Laws of the State of New-York.

SAMUEL DOWN, President. HENRY CARTWRIGHT, Vice-President. THOMAS J. EARLE, Secretary.

Trustees:

SAMUEL DOWN WILLIAM HOPPER, R. H. GRATZ, HENRY CARTWRIGHT, RICHARD MERRIFIELD.
THOMAS C. HOPPER, Superintendent at Philadelphia.

This Company is now prepared to furnish WET AND DRY GAS METERS, STATION METERS, GOVERNORS, PRESSURE INDICATORS AND REGISTERS, SERVICE and METER COCKS, and all articles in their line appertaining to the use of Gas Works.

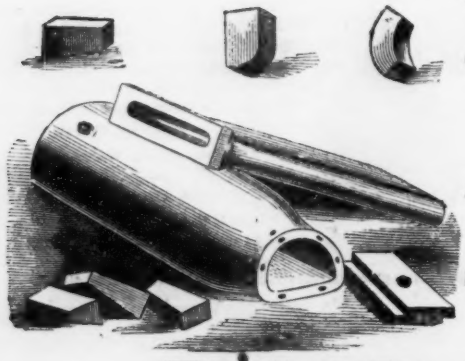
The combination of Mechanical and Scientific Skill, and the long experience of the several members of the Company, is a sure guarantee of durability, accuracy and excellence of Workmanship. Orders addressed

AMERICAN METER COMPANY,

West Twenty-Second Street, New York. Arch and Twenty-Second Streets, Philadelphia. 321 Washington Street, Boston, will meet with prompt attention.

BALTIMORE RETORT AND FIRE BRICK WORKS.

GEO. C. HICKS & CO.



CLAY RETORTS FOR GAS WORKS AND SUGAR REFINERIES.

TILES AND BLOCKS OF ALL KINDS.

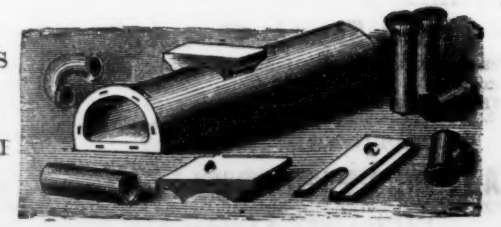
FIRE BRICK.

FIRE MORTAR, CLAY AND SAND.

ALL KINDS OF FIRE CLAY MATERIALS

The Only XX Fire Brick.

☞ RETORTS OF THE VARIOUS SIZ I KEPT ON HAND.



Vitrified Steam Pressed Drain and Sewer Pipe.

HARRIS & BROTHER,

ESTABLISHED 1848.

PRACTICAL GAS METER MANUFACTURERS,

Continue as heretofore at the OLD ESTABLISHMENT, Nos. 1115 and 1117 Cherry Street, Philadelphia, Pa.,

To manufacture Wet and Dry Gas Meters, Station Meters, Experimental Meters, Meter Provers, Centre Seals, Governors, Pressure Registers, Indicators, Photometers, and all kinds of Gas Apparatus; Also furnish all other Articles appertaining to the use of Gas Works.

From our long Practical Experience of the Business (covering a period of 20 years) and from our personal supervision of all Work, we can guarantee all orders to be executed promptly, and in every respect satisfactorily.

J. Wesley Harris, Washington Harris, William Helme.

GAS PURIFICATION.

St. John and Cartwright's
NEW IRON COMPOSITION

Has purified, per bushel, on a single test, 10,000 feet of Westmoreland Gas. With revivification lasts indefinitely. Surpasses in POWER and ECONOMY all known materials. Saves largely in FIRST COST, SPACE, LABOR, SUPERINTENDENCE, and all current expenses. Will purify *easily* sulphurous gas, wholly *unmanageable by lime.* Takes out *all the ammonia.* Now operating in the following Gas Works: Harlem, New York (21st street); Port Morris; Hunter's Point; East New York; Worcester, Lynn and Cambridge, Mass.; Lewiston, Maine; St. Albans, Vt.; Pawtucket, R. I.; Meriden, Ct., and being introduced in many other places.

Cost 70 cents per bushel. One bushel for each square foot of Purifier sufficient. Rights to use for life of Patents, for daily makes of gas in thousands; under 25,000 $200; under 50,000, $400; under 100,000, $500; $250 additional for each additional 50,000 per day.

For further information and instructions, apply to
ST. JOHN & CARTWRIGHT,
21st Street and Avenue A, New York Gas Works.

☞ Immediate arrangements are urged, as the demand for prepared composition is increasing *so rapidly* that delays supply may occur.

C. CEFRORER,

Manufacturer of

GAS BURNERS,

GAS HEATING AND COOKING APPARATUS,

FITTERS' PROVING APPARATUS. ETC.,

No. 248 North Eighth Street, Philadelphia.

RILEY A. BRICK & CO.,

MANUFACTURERS OF

CAST IRON PIPES,

FOR WATER AND GAS,

ALSO,

GAS WORKS & MACHINERY CASTINGS

OF EVERY DELCRIPTION,

No. 89 White Street, New York.

Riley A. Brick. Jas L. Robertson.

B. S, BENSON.

MANUFACTURER OF

Cast Iron Pipes and Fittings,

AND

Gas and Water Mains.

All sizes from 3 to 30 inch cast vertically in 12½ feet lengths

Office & Factory 52 East Monument St.,

BALTIMORE, MD.

SITUATION WANTED BY A COMPETENT AND energetic Gas Engineer, as Superintendent of Gas Works. Has had many years experience, and is thoroughly conversant with the management of gas accounts. Can produce testimonials as to capability. Address C. E. S., office of this Journal 305

R. D. WOOD & CO.,

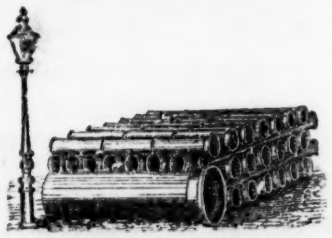
PHILADELPHIA.

MANUFACTURERS OF

CAST IRON GAS & WATER PIPES,

Matthews Patent Hydrants.

Lamp Posts, Etc.



For tae accommodation of parties who may wan small lots Pipe for *immediate* delivery, we have established a yard in New York City.

We have on hand here several thousand feet of small Pipe rom which we can ship orders readily to any part of the country.

R. PAINE, Selling Agent,
No. 173 Broadway, New York,
3-tf SECOND FLOOR.

GLOUCESTER IRON WORKS.

GLOUCESTER CITY, NEW JERSEY.

DAVID S. BROWN, Pres't. JAMES P. MICHELLON, Sec'y.
BENJ. CHEW, Treas. WILLIAM SEXTON, Sup't.

OFFICE, PHILADELPHIA,
No. 6 North Seventh St., (west side.)

—oo—

CAST IRON GAS AND WATER PIPE

PIPE CAST VERTICAL.

1½ to 48 inches diameter.

Cast Iron Flange Heating and Steam Pipe.

STOP VALVES FOR WATER OR GAS, ALL SIZES.

Fire Hydrants,

GAS HOLDERS,

TELESCOPIC OR SINGLE.

☞ Castings and Wrought Iron Work of all kinds for Ga Works. 253-6m

S. FULTON & CO.,

PLYMOUTH IRON WORKS,

CONSHOCKEN, PA.,

Manufacturers of

PIG IRON & CAST IRON GAS & WATE PIPES.

Also, Heavy and Light Castings of every description.
412 Walnut street, Philadelphia, Pa.

SAMUEL FULTON, THEO. TREWEND

AMERICAN JOURNAL OF SCIENCE & ARTS

FOUNDED BY PROF. SILLIMAN IN 1818,

And now numbering 100 volumes, in two Series of 50 vols. each.

Editors and Proprietors: Profs. Silliman and Dana.
Associate Editors: Profs. Gray and Gibbs of Cambridge, and Newton, Johnson, Brush and Verrill of Yale.

Devoted to Chemistry, Physics, Geology, Mineralogy, Natural History, Astronomy, Meteorology, etc.

A Third Series in MONTHLY numbers, making two volumes a year of about 450 pages each, from January, 1871. Subscription price $6.00 a year, or 50 cents a number.

A few complete sets on sale of the first and second series.

Address, **SILLIMAN & DANA,**
New Haven, Ct.

NORTHWESTERN GAS AND WATER PIPE COMPANY.

—oo—

WORKS, AT BAY CITY, MICHIGAN.

CHICAGO OFFICE, 646 WABASH AVENUE.

SECTION OF GAS PIPE.

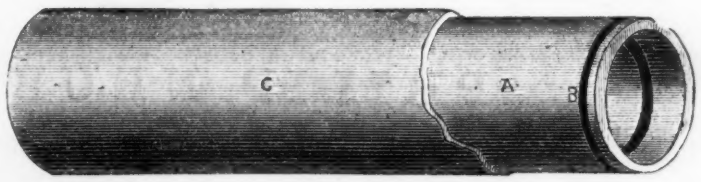


FIG. 2.

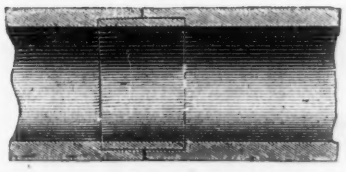


FIG. 3.

A.—Cylinder of Wood. B—Band of Iron. C—Coating of Hydraulic or Asphaltum Cement.

FIG. 2.—Thimble for Connection. FIG. 3—Horizontal Section and Connection.

Above is a cut of the

"WYCKOFF PATENT IMPERISHABLE GAS PIPE,"

manufactured by the NORTHWESTERN GAS AND WATER PIPE COMPANY.

This Pipe is made of White Pine, one inch to sixteen inches bore, in sections eight feet long, rounded in a lathe, coated inside and out with Asphaltum, connected with a tenon, or socket, and a thimble joint, perfectly air and water tight, being driven together with cement furnished by the Company. When laid its cost is about one half that of Iron Pipe, and is UNQUESTIONABLY the best Gas conducting Main in use.

☞ Send for Descriptive Pamphlet and Price List. 242-1y

DENNIS LONG & CO.,

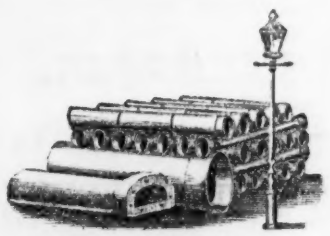
Union Pipe Works,

Louisville Pipe Foundry,

AND

Union Foundry and Machine Shops,

LOUISVILLE, KY.



MANUFACTURE

Cast Iron Gas and Water Pipe,

All Pipe cast vertically in dry sand.

2 inch Pipes in 8 feet lengths. 3 inch to 60 inch cast in 12 feet lengths.

RETORTS AND MOUTH PIECES, LAMP POSTS, CONDENSING PIPE, HYDRAULIC MAINS, PURIFIERS, DRIPS, ELBOWS, T'S, CROSSES, SLEEVES, VALVES, &c., &c.

GAS-HOLDERS.

And every description of work necessary for Gas or Water Companies.

JESSE W STARR & SONS,

Camden Iron Works

Camden, New Jersey,

MANUFACTURERS OF

ALL KINDS OF CASTINGS AND APPARATUS FOR GAS WORKS,

Wrought Iron Roof Frames,

For Retort and other houses. Retorts and all castings required for setting them in the latest and most improved model. WASHERS, CONDENSERS, SCRUBBERS and EXHAUSTERS, for relieving the Retorts from pressure. PURIFIERS, varying from 2,000 to 2,000,000 cubic feet daily purifying capacity.

Wrought Iron Lime Sieves,

for Purifiers. Station Meters of all sizes.

GAS HOLDERS,

TELESCOPIC AND SINGLE,

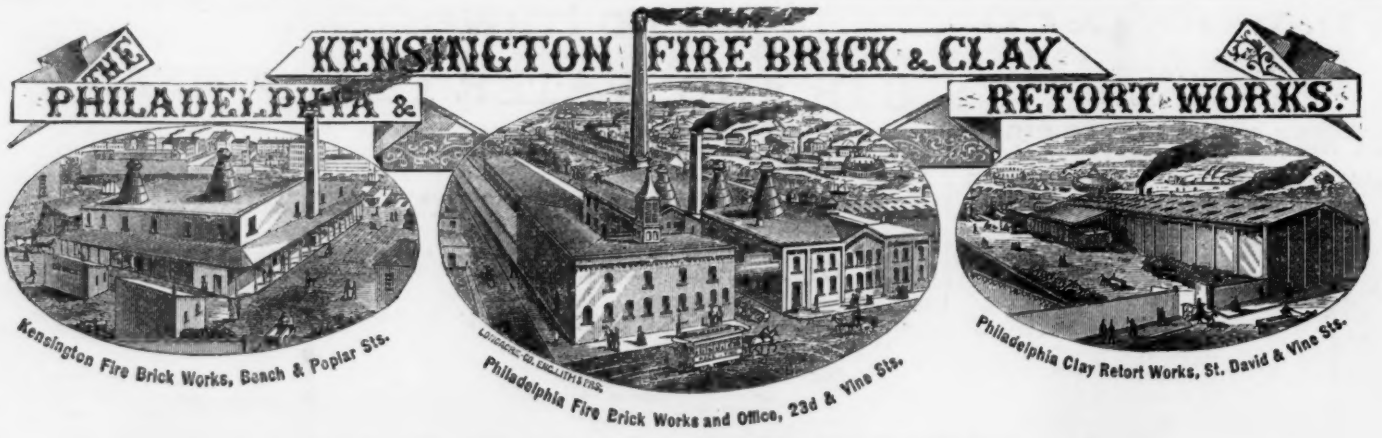
With cast iron guide and suspension frames. GAS GOVERNORS or REGULATORS, STREET MAINS, from 1½ to 48 INCHES DIAMETER, for WATER or GAS. Street Main connections, such as BRANCHES, BENDS, DRIPS, SLEEVES, etc.

STOP VALVES, from 3 to 30 inches, for both Water and Gas.

Wrought Iron Work.

All the Smith and Sheet Iron work required in and about Gas Works. 226-1f

JESSE W. STARR. BENJ. A. STARR. BENJ. F. ARCHER


THE PHILADELPHIA &
KENSINGTON FIRE BRICK & CLAY
RETORT WORKS.
Kensington Fire Brick Works, Beach & Poplar Sts.
Philadelphia Fire Brick Works and Office, 23d & Vine Sts.
Philadelphia Clay Retort Works, St. David & Vine Sts.

PHILIP NEUKUMET,

(SUCCESSOR TO JOHN NEUKUMET),

Manufacturer of Fire Bricks, Tiles, Gas and Sugar House Retorts.

☞ Plans of Settings for Benches of Threes, Fives, and Sixes furnished, free of charge, upon application.

WILSON & GARDNER.

Works, Lockport, Westmoreland Co., Pa.

Office, 96½ Fourth Avenue, Pittsburgh, Pa., Rooms 1 and 2.

MANUFACTURERS OF

CLAY RETORTS, FIRE BRICK, TILE, Etc.

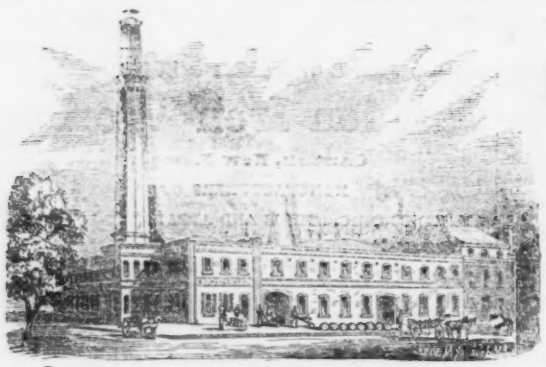
FROM CLAY, SAME SPECIES, AND EQUAL TO

BEST BELGIAN.

☞ ORDERS PROMPTLY FILLED. IMPROVED WORKING PLANS OF THREES AND FIVES UPON APPLICATION.

REFERENCES:

Gas Works Northwest, West, and South.



NEW YORK

FIRE BRICK AND CLAY

Retort Works.

☞ *Established in* 1845. ☜

(Branch works at Kreischerville, Staten Island.)

B. KREISCHER & SON,

OFFICE,

58 Goerck Street, cor. Delancy, N. Y.

GAS RETORTS, TILES & FIRE BRICK
Of all shapes and sizes.

FIRE MORTAR, CLAY AND SAND.

Articles of every description made to order at the shortest notice.

B. KREISCHER & SON

MANHATTAN

FIRE BRICK & ENAMELLED CLAY

Retort Works.

MAURER & WEBER,

(Of the late firm of B. Kreischer & Co.,)

PROPRIETORS.

Office and Works, 15th Street, Avenue C.

Manufactures of

FIRE BRICK AND TILES,

Of all shapes and sizes.

FIRE MORTAR, CLAY AND SAND.

☞ Articles of every description made to order at short notice. (135

HY. MAURER. ADAM WEBER.

GRAHAMITE,

OR

RITCHIE MINERAL.

The yield of this Asphalt is nearly double, and the Candle Power more than double the product of Gas Coals, and it is extensively used by great and small companies, chiefly as an enricher and stimulant, in the proportion of five per cent. Yield 15,000 to 16,000 feet per gross ton. Illuminating power 30 to 32 candles. One bushel of lime purifies 6000 feet. Coke very strong. It is incapable of spontaneous combustion or caking in the heap, and is used by simple addition to the charge.

We sell at figures which allow a much larger profit to the purchaser, with better light than any standard coal.

No gas material is at once so safe and so cheap. Our Asphalt is used in the manufacture of Varnish, Roofing, Ship Paint, Tiles, Pavements, Water Proof Paper, Cloth, and for all purposes where a coating is required that is unaffected by Water, Gasses, Alkalies, or Acids.

The Ritchie Mineral Resin and Oil Co.

9?2 3m No 27 South Charles St., Baltimore, Md.

JERSEY CITY

GAS METER WORKS.

R. M. POTTER & CO.,

MANUFACTURERS OF

CONSUMERS GAS METERS, WET AND DRY,

Station Meters, Center Seals, Governors, Pressure Registers,

AND ALL KINDS OF PRESSURE GAUGES.

Experimental Meters and Standard Test Gasholders,

☞ And all apparatus in use at the Gas Works ☜

14 Morris St., Jersey City, N. J. (1y

LACLEDE FIRE BRICK

AND

Clay Retort Works,

Cheltenham, St. Louis Co., Mo.

Laclede Fire Brick Manufactnring Co.

Office, 901 Pine Street. Warehouse, 1007 N. Levee, St. Louis

NOW READY AND FOR SALE,

FODELL'S

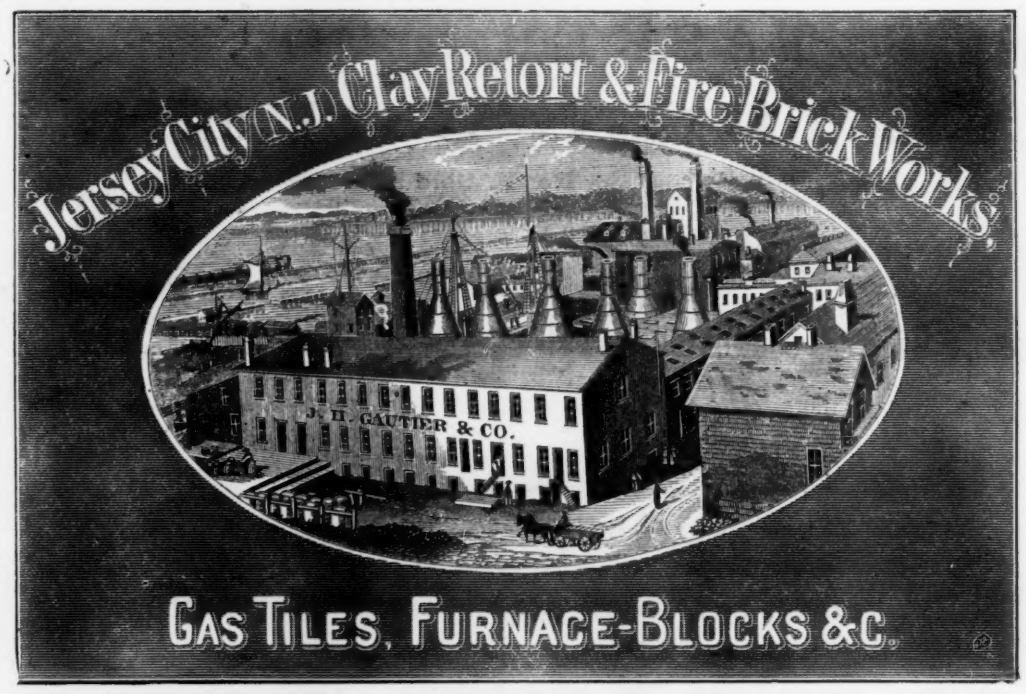
System of Bookkeeping

FOR GAS COMPANIES.

Price $5, which should be sent either in Check, P. O. Order, or Registered Letter.

Blank Books, with printed headings and forms on this system, will be supplied to Gas Companies, by applying to W. P FODELL, Philadelphia, or

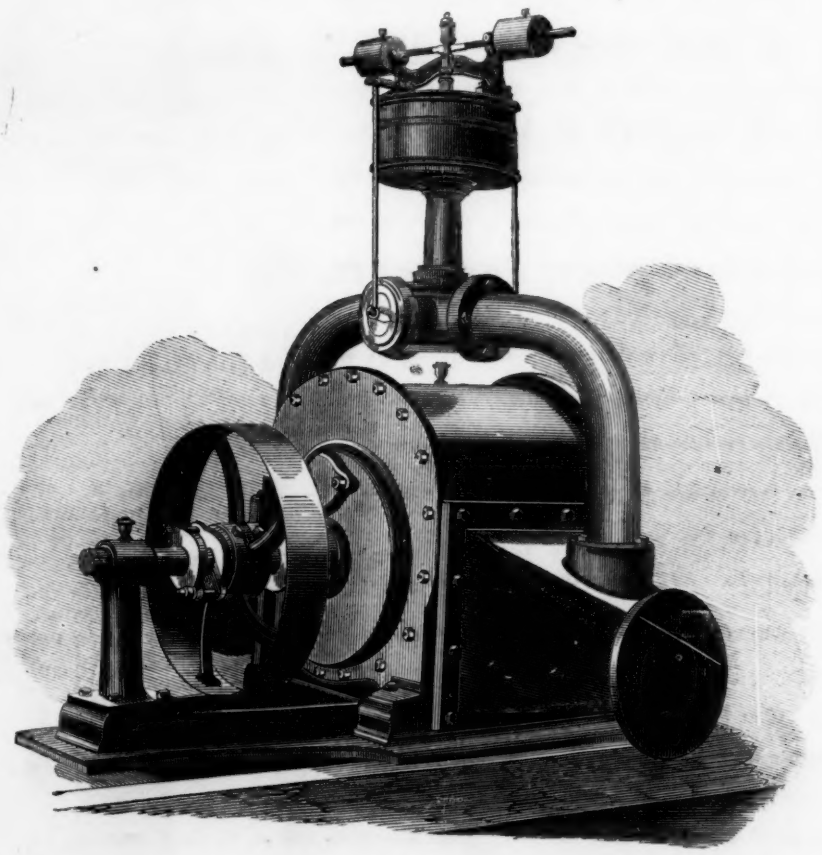
A. M. CALLENDER & CO.,
Office GAS-LIGHT JOURNAL, 42 Pine St., N.Y.



SMITH & SAYRE MANUFACTURING COMPANY.

The Mackenzie Patent Gas Exhauster

And Patent Compensator.



They are made to pass from 4,000 to 150,000 cubic feet of gas per hour; will increase the production and illuminating power of the gas, and add very much to the durability of the retorts, either clay or iron. The Compensator obviates entirely the necessity of water-joints, is compact, durable, cleanly, not liable to get out of order, self-acting, quiet, and certain in its operation.

We are also sole proprietors and manufacturers of the

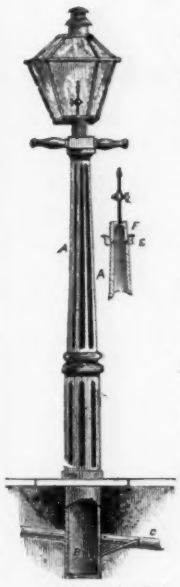
MACKENZIE PATENT BLOWER, PATENT CUPOLA AND SMELTING FURNACE.

The Blower is a Force Blast machine, durably built, and can be driven with one-third the power required to drive the ordinary Fan. The Cupolas are manufactured in sizes to melt from 1 to 20 tons per hour, will save one quarter of the time required by the old style Cupola, and 33 per cent fuel. Address

G. G. PORTER, President.
JAMES M. SAYRE, Treasurer.
CHARLES W. ISBELL, Secretary. OFFICE, 25 LIBERTY STREET, New York.

GRAHAM'S

Patent Anti-Freezing LAMP POST.



THE BEST, CHEAPEST AND MOST DURABLE POST EVER OFFERED TO THE PUBLIC.

WOOSTER, OHIO
Jan. 24, 1871.

J. W. GRAHAM,

Dear Sir: Yours of the 14th inst at hand. In reply I would say that we have tested the six anti-freezing Lamp Posts purchased from you, and find them to be all as you represented. Whilst nearly a dozen of our sixty-five Posts were frozen down last month and first of this not one of yours was affected by the heavy frost. What can you sell them at?

Yours truly,
LUCAS FLATTERY
Sec'y Wooster Gas-Light Co.

Address the Patentee,
J. W. GRAHAM,
Chillicothe, Ohio.

250-9t

AGENCY FOR

GIBSON'S IMPROVEMENT

IN THE

Manufacture of Coal Gas,

41 PINE STREET, ROOM 1.

The undersigned having been appointed Special Agent for the introduction of GIBSON'S Substitute for Dip-Pipes in the Manufacture of Coal Gas, respectfully presents for the consideration of Gas-Light Companies the Circulars and Pamphlet issued by the American Coal Gas-Light Imp. Co., descriptive of the value of GIBSON'S Improvement, and the mode by which Gas-Light Companies can satisfy themselves of its usefulness, without trouble or expense, at their own works.

Orders for fitting up Valves of any desired form or patent, *subject to the generality of the Gibson claim*, and also for SUPPLIES and MATERIALS of every description required for the use of Gas Light Companies promptly attended to by

W. H. GRENELLE, Special Agent.

REFERENCE.—RICHARD MERRIFIELD, ESQ., late Vice President MANHATTAN GAS-LIGHT COMPANY.

WORKS UPON GAS.

BOWDITCH.—THE ANALYSIS, TECHNICAL VALUATION, Purification, and Use of Coal Gas, with illustrations, 8vo. cloth. Price, $4.50.

THE GAS MANAGER'S HAND BOOK; consisting of Tables, Rules, and Useful Information for Gas Engineers, Managers, and others engaged in the Manufacture and Distribution of Coal Gas. By Thomas Newbigging; 8vo. cloth. $3.75.

BOWER—Gas Engineer's Book of Reference, illustrated, 4to. Price, 75c.

CLEGG—Treatise on the Manufacture of Coal Gas, 5th edition, enlarged, 4to, cloth. Price, $10.50.

COLBURN—The Gas Works of London, 12mo, boards. Price, 60 cents.

GAS CONSUMERS' GUIDE—A Hand Book of Instruction on the proper management and economical use of gas, etc., etc. 12mo., cloth. Price, $1.00.

HUGHES—Gas Works and Manufacturing Coal Gas, 12mo. Price, $1.20.

MASON—The Gasfitter's Guide, paper. Price, 50 cents.

D'HURCOURT—De l'Eclairage du Gas. Par E. R. Hurcourt, 3d edition. Paris, 1863; 8vo. and plates, $6.00.

RICHARD—Gas Consumer's Guide, 12mo. Price, 50 cents.

SWEET—Special Report on Coal, showing its Distribution, Classification, and Cost, delivered over different routes to various points in the State of New York, and the principal cities on the Atlantic Coast. By S. H. Sweet, with Geological Maps. 1 vol. 8vo. cloth, $3.

SUGG—Gas Manipulation, with a description of the various Instruments and Apparatus employed in the Analysis of Coal and Coal Gas, 8vo., cloth. *Scarce.*

WILKINS—How to Manage Gas; 24mo., paper. Price, 25c.

SCHILLING—Traite d'Eclairage par le Gaz. Price, $22.

For sale by

D. VAN NOSTRAND, Publisher,
23 Murray Street and 27 Warren Street
(Upstairs).

☞ Our new and revised Catalogue of American and Foreign Scientific Books, 80 p. 8vo., sent to any address, on receipt of ten cents in postage stamps. 291

MORRIS, TASKER & CO.,

PASCAL IRON WORKS,

Corner Fifth and Tasker Streets, Philadelphia, and No. 15 Gold Street, New York.

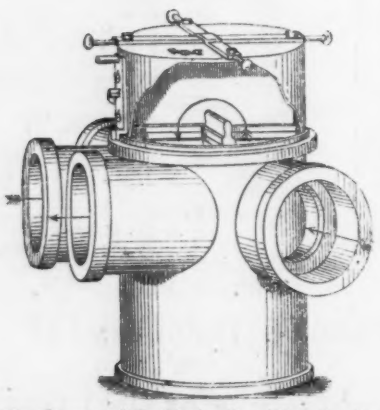
Established 1821,

THOMAS T. TASKER, JR., STEPHEN P. M. TASKER.

FOR GAS WORKS MACHINERY, ADDRESS CORNER FIFTH AND TASKER STREETS, PHILADELPHIA.

Manufacturers and Builders of Gas Works, &c., of all Descriptions, of the Most Approved Plans.

No. 1.



By Pass with Drip for Single Apparatus.

Messrs. MORRIS, TASKER & Co., respectfully ask the attention of Gas Engineers and others, interested in the erection of Gas Works and the manufacture of Gas for illuminating purposes, to their new and improved By-Passes, which are made from entirely new and original designs.

They are constructed with water seal compartments to pass the gas through the required channels without leakage; with drip chambers to catch the water of condensation, tar, and ammoniacal liquor; and also with a loose or circular valve, to control the direction of the gas flow.

The By-Passes shown in the annexed illustrations, are similar in construction and varied in size to suit works of different capacity

No. 1 is a By-Pass for Gas Works of small generating power, and using but a single apparatus; the gas from the retorts enters the proper nozzle, as shown by the arrow, and being deflected by the diaphragm of the valve over one of the vertical partitions of the drip chambers, it passes through one of the nozzles to the meter and returns to be again deflected by the rotary valve to the gas holder.

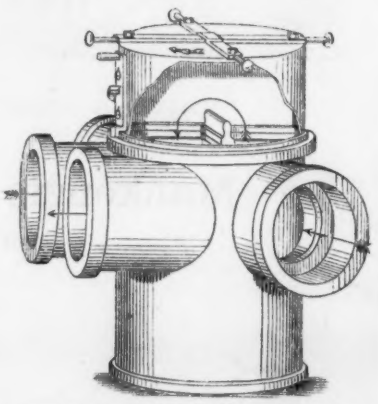
No. 2 is a By-Pass for using two apparatus, the gas is entered and the direction of its current is controlled similarly to that of No. 1, just described.

No. 3 is a By-Pass for passing the gas around the meter or not, according to the set of the loose or circular valve.

No. 4 is a sectional view of No. 3, and fully illustrates the construction and arrangement of the various By-Passes; the vertical partitions P are placed at right angles and divide the By-Pass into four drip chambers, they extend to within a short distance of the bottom to allow the water W, which forms the water seal, to circulate freely; the valve V is constructed with a diaphragm which divides it diametrically, the edges from ground joints with the upper edges of the partitions P, to prevent the gas from leaking from one chamber to another, and also to protect the ground surfaces from the corrosive action of the gas.

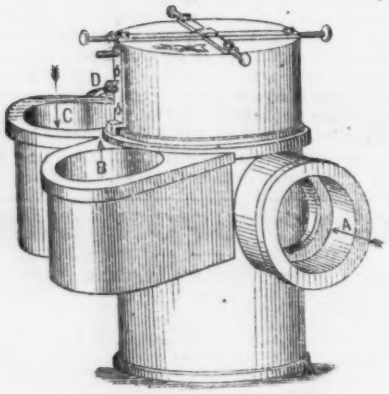
No. 5 is a single By-Pass with Drip Chambers.

No. 2.



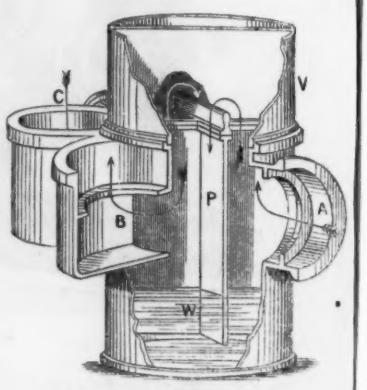
By Pass with Drips for two Apparatus.

No. 3.



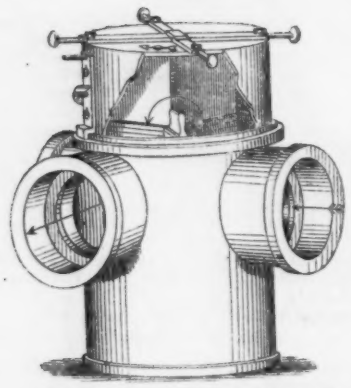
Meter By Pass with Drip.

No. 4.



Section of No. 3.

No. 5.



Single By Pass with Drip.

LE JL '09